TRC
Results you can rely on

708 Heartland Trail
Suite 3000
Madison, WI 53717

608.826.3600 PHONE
608.826.3941 FAX

www.TRCsolutions.com

September 11, 2015

Ms. Demaree Collier
U.S. Environmental Protection Agency
Region 5 (HSRM-7J)
77 West Jackson Blvd.
Chicago, IL 60604

Subject: Lemberger Landfill Source Control Evaluation
Whitelaw, Manitowoc County, Wisconsin

Dear Ms. Collier:

On behalf of the Lemberger Sites Remediation Group (LSRG), TRC Environmental Corporation (TRC) is submitting the above-referenced report for your review. This report summarizes and evaluates five rounds of groundwater sampling performed at and in the vicinity of the LL. This work was performed to evaluate whether leachate extraction is necessary at the site to meet overall remedial objectives. We expect to discuss the data, conclusions, and recommendations contained within this report during our meeting in Madison on September 23, 2015.

If you have any questions during your review, please contact me at 608-826-3637.

Sincerely,

TRC Environmental Corporation

Kristopher D. Krause, P.E.
Senior Project Manager

Enclosure

cc: Tauren Beggs – WDNR
Gary Edelstein – WDNR
Brian Potts – Foley & Lardner
Kristin Jones – Newell Rubbermaid
Nilaksh Kothari – Manitowoc Public Utilities
Tom Reed - Manitowoc Public Utilities
James Wallner – Red Arrow Products
Chris Meyer – The Manitowoc Company, Inc.
Kathleen McDaniel – City of Manitowoc
David Dougherty – Subterranean Research, Inc.
Doug Ucci – Quantum Management Group, Inc.
Kenny Ogilvie – EHS Support, LLC
Beth Hesse – EHS Support, LLC

Lemberger Landfill Source Control Evaluation

Lemberger Landfill
Whitelaw, Manitowoc County, Wisconsin

September 2015

Prepared For
Lemberger Site Remediation Group

© 2015 TRC
All Rights Reserved

Table of Contents

List of Tables

List of Figures

List of Appendices

Section 1
Background

The Lemberger Landfill (LL) is a former mixed waste landfill that received municipal waste and some fly and bottom ash over a period of approximately 30 years. Landfill waste was placed upon glacial sediment that consists of silt and sand of the Upper Granular Unit (UGU) underlain by lacustrine clay of the Confining Unit (CU). At the LL, the UGU ranges from 6 feet to 15 feet in thickness, reaching its thinnest at the southeast corner. Similarly, the CU ranges from 18 feet on the west side, to only a foot or so at the southeast corner of the LL (Figure 1). While the Lower Granular Unit (LGU) underlies the CU throughout most of the area, the LGU is absent at the southeast corner of the LL, with the CU and possibly the UGU resting directly on the weathered rock surface. Accordingly the depth to rock shallows to the east, decreasing from 62 feet below ground surface (bgs) at RM-5D to 20 feet bgs at the southeast corner of the LL (Figure 2).

Source control measures were implemented at the LL in the 1990s. These efforts included the installation of a multi-layered cap over the waste and construction of a low-permeability slurry wall around the perimeter of the former landfill, using the CU as a natural barrier at the base. The slurry wall was designed to penetrate a minimum of 3 feet into the CU. It was determined during construction, however, that the CU was thinner than expected at the southeast corner of the LL and the slurry wall was placed upon the bedrock surface. Extraction wells were included to remove leachate that had accumulated in the UGU overlying the confining layer. The extraction wells operated for 10 years and dewatered the accumulated leachate from the UGU and waste within the containment area.

Monitoring data from the LL have demonstrated that the performance criteria stated in the Record of Decision (ROD) have been met since remedial measures were completed in 1996. Leachate levels decreased markedly within the LL for the first several years, then decreased gradually thereafter. The operations and maintenance plan (O&M Plan) for the LL containment area set a target of not more than 1 foot of leachate accumulation above the clay confining unit. This target has proven to be difficult to achieve at some portions of the LL and has resulted in ongoing discussions between the USEPA, WDNR and LSRG of whether this target is necessary or appropriate.

The Third Five-Year Review for the Lemberger sites (USEPA, 2010) recommended that USEPA review the need to continue leachate extraction at the Lemberger Landfill (LL) site, and issue an Explanation of Significant Difference (ESD) if it was determined that leachate extraction could end. Leachate extraction at the LL was suspended in 2008 to monitor leachate levels as a test of a water balance model that suggested leachate levels should remain stable even under non-pumping conditions. Monitoring since 2008 revealed leachate levels rose very slowly, suggesting the model slightly underestimated the degree of infiltration or overestimated the degree of loss through the CU. Leachate levels at LW-07 were determined to possibly be in contact with the waste immediately after the pump was turned off in that well. In addition, LH-06 and LH-07 showed the leachate level sharply rises on a seasonal basis then rapidly recedes. The agencies inquired whether this would result in an increase in concentration of contaminants of concern in groundwater. The highest leachate levels reached at LH-06 also contacted the waste. This "spikey" behavior had also occurred during leachate extraction, but the magnitude of the "spikes" increased when the leachate extraction ended. This behavior was attributed to possible "integrity gaps" identified in the Leachate Head Evaluation Report (RMT 2007).

In 2011, USEPA requested additional evaluation to determine if the LL was contributing to groundwater contamination. That evaluation (TRC, 2011) concluded the LL containment system was protective, but due to the potential for leachate contacting waste, pumping leachate extraction well LW-07 would be continued for one year while data were collected and options for long-term management of the site could be evaluated. Issues to be considered in the evaluation included administrative and policy issues, as well as the potential impact to groundwater if leachate contacts waste.

The LSRG issued a summary of the LL performance to U.S.EPA and the WDNR by letter dated December 24, 2013, as the initial step to obtain a long term solution for the LL. In that letter, the LSRG concluded that while leachate levels have risen somewhat, the containment system at the LL continued to perform adequately to protect groundwater quality. USEPA and WDNR responded in March 2014 with three issues that they felt needed to be addressed in order to better understand the potential risk posed by the LL: 1) revisit the water balance model to gain a better understanding why leachate levels continue to rise, 2) collect additional chemical data on the leachate to determine if the spikes in leachate levels result in higher concentrations of constituents, and 3) evaluate if contaminants are or may migrate from the LL if the leachate extraction system does not operate.

On May 15, 2014, a meeting was held at the USEPA office in Chicago that included the LSRG and their consultants, WDNR, and USEPA. The meeting included a mind mapping session that identified the remaining areas of uncertainty at the LL and associated issues of concern. The key issue identified in the meeting was whether leachate accumulation in the LL results in an unacceptable risk to human health and the environment and to focus on the southeast corner of the LL to evaluate if constituents of concern are migrating outside the slurry wall. A field effort was developed to address these concerns. Key elements of the study were to: 1) cease leachate extraction at LW-07, 2) resume monthly groundwater and leachate level monitoring, and 3) collect samples of leachate in the vicinity of the LL on a quarterly basis to determine if there are seasonal variations in leachate chemistry related to intermittent contact of leachate with the waste. This report presents the results of that investigation and provides recommendations for a path forward.

Section 2
Results of the Study

The initial task of the field effort was to suspend leachate extraction at LW-07 to simulate conditions if the landfill was closed with no active leachate extraction. Leachate extraction was discontinued on May 14, 2014. Leachate level monitoring was conducted on a monthly basis at 25 wells within the containment (slurry wall) and shallow groundwater levels were also monitored outside the LL. In addition, five rounds of quarterly sampling were conducted at wells LW-01, LW-07, LH-06, LH-07, and RM-302S from May 2014 through June 2015.

2.1 Leachate and Groundwater Levels at the Southeast Corner

The leachate and groundwater level monitoring provided some additional understanding of the periodic "spikes" in leachate levels at LH-06 and LH-07. No other wells within the LL containment system display this behavior. The data are provided as hydrographs in Appendix A and are summarized as follows:

- Peak leachate elevations at LH-06 and LH-07 are not identical in height or time. The peak elevations at LH-06 consistently exceed 850 feet msl and even exceed 855 msl in 2011 and 2013, while at LH-07 the peak elevations never exceed 849 msl. LH-06 and LH-07 showed annual peak elevations typically occurring in different months as follows:

Year	LH-06	LH-07	RM-301S	RM-214D
2009	May	None	March	May
2010	March	August	April	August
2011	May	August	April	May
2012	None	May	April	June
2013	February	February	June	June
2014	May	May	June	June

- The leachate level behavior at LW-01 located in the southeast corner of the LL is similar to the leachate level behavior exhibited in all other wells within the LL containment showing only gradual changes over time (Appendix A). The elevation during pumping maintained a relatively consistent elevation of approximately 842 msl and currently maintains a consistent level of approximately 845 msl.
- Outside the containment where conditions are reflective of "background" water levels in the UGU, peak groundwater elevations occurred at RM-301S in March (2009), April (2010, 2011, 2012) and June (2013, 2014). Peaks at southeast corner well RM-302S occur in similar

months but the peaks are broader and the magnitude of the peaks is much less than RM-301S.

- Groundwater at bedrock well RM-214D shows peak groundwater elevations slightly later in the year with peaks occurring in May (2009, 2011), June (2012, 2013, 2014) and August (2010).

2.1.1 Discussion

Overall, the leachate behavior in the LL exhibits what is typically seen in a controlled hydrologic system. The slow, gradual changes in leachate levels are indicative of a system that is unaffected by seasonal variations or large precipitation events as seen in the both the UGU and LGU – and in LH-06 or LH-07. Obviously, LH-06 and LH-07 are more closely associated with natural events, suggesting the wells are either receiving infiltration through the surface (i.e., a leaky surface seal) or are in contact with flow from outside the containment area. The latter seems unlikely since the groundwater elevation at RM-302S is consistently several feet higher than measured at the leachate head wells. The screened interval for LW-01 partly overlaps the screen intervals of both LH-06 and LH-07 (Figure 2), so if there were a hydrologic connection between the wells, LW-01 should share some of the same oscillations in the leachate levels. With the hydrograph for LW-01 showing virtually no similarity to those wells, this suggests that the hydrologic variability in the head wells is a localized phenomenon – and not even continuous between wells 150 feet apart (distance from LH-07 to LW-01).

Occasional spikes at LH-06 and LH-07 are likely related to infiltration and recharge as seen in all other monitoring wells outside the LL containment. The lack of a similar response at LW-01 (or any of the other 14 wells at the LL) suggests that there is no hydrologic connection between the two leachate head wells and the nearby extraction well. It is possible that both LH-06 and LH-07 are screened in a perched "water table" unit that is not encountered elsewhere. Both wells are at the highest elevations of the LL and their screen elevations are above the other neighboring wells. The upper portions of these wells contact the waste, and the lower portion of their screens spans the UGU. The borings for LH-06 and LH-07 only penetrated the upper several feet of the CU so the nature of the material beneath the clay surface is unknown whether there is another thin saturated unit or bedrock. However, the data suggest these wells react rapidly to infiltration and then drain to dryness.

2.2 Leachate Analytical Results

Sufficient leachate was available to sample LW-01 and LW-07 for all five sampling rounds during the period of study. LH-06 and LH-07 only had sufficient leachate for sampling during two of the five proposed sampling events. These data were combined with previous analytical results to prepare a summary provided as Table 1. The complete analytical results are summarized in Appendix B.

VOCs were detected in all leachate samples, though only trace concentrations (<1 μg/L) of chlorobenzene were detected in LW-01, while multiple organics were detected in LH-06, LH-07, and LW-07. The following summarizes VOC detections in each well:

- **LH-06** – In 2000, LH-06 was found to have concentrations of VOCs that included 21 different compounds; 11 of which exceeded the WDNR ES. In the two sampling events in 2014/2015, there were 14 VOCs detected with only four compounds [benzene, 1,2-dichloroethane (DCA), cis-1,2-dichloroethene (DCE), and vinyl chloride] exceeding the ES. Other detections in 2014/2015 included acetone, 2-butanone, 1,1 DCA, ethyl benzene, toluene, trichloroethene (TCE), and xylene. All of these compounds were detected in 2000, but concentrations have decreased markedly. Some examples include:
  - 1,2-DCE (total) decreased from 10,000D μg/L to 144.1 μg/L(cis + trans)
  - 1,1,1-TCA (380D μg/L to 0.72J μg/L)
  - 1,1 DCA (1,200D μg/L to 31.3 μg/L, methylene chloride (9,600 μg/L to <2.3 μg/L), and vinyl chloride (290 μg/L to <1.8 μg/L).

    Note: The "D" qualifier notes the sample had to be diluted in order to be analyzed. Dilution was not required in the 2014/2015 samples.

- **LH-07** – Five (5) different VOCs were detected in LH-07 from the sample collected in October 2014 but concentrations were typically very low and no concentration exceeded the ES. Compounds detected include: 1,1 DCA, acetone and benzene. As with LH-06 concentrations have decreased markedly from a sample collected in 2000. No VOCs were detected in the May 2014 sample.
- **LW-01** – All VOCs were below detection limits except for chlorobenzene at concentrations 0.5 μg/L to 0.82 μg/L. There are no historical data for this well.
- **LW-07** – Benzene was detected in all samples at concentrations above the ES (5 μg/L). Concentrations range from 8.0 μg/L to 12.5 μg/L. Other compounds detected include chloroethane at concentrations ranging from 15.6 μg/L to 31.3 μg/L and xylene (6.2 μg/L to 26.3 μg/L. These results are consistent with analytical results of a sample collected from LW-07 in 2010 (RMT, 2010).
- **RM-302S** – Groundwater samples were collected from RM-302S, the UGU monitoring well located close to the possible integrity gaps in the slurry wall. No VOCs were detected in these samples.

Field parameters collected during sampling can be used to compare the geochemical environment at different locations as summarized in Table B-1 (Appendix B). Comparisons can be made to shallow groundwater at RM-302S to individual leachate wells to determine if any of these chemical indicators suggest that constituents may be escaping the LL containment. Specific conductance, for example, is commonly elevated in landfill leachate and can serve as a conservative "tracer" for leachate migration, as it is less likely to be retarded by adsorption than VOCs. The following summarizes results from select field parameters:

- **Specific conductance** – Values of specific conductance at wells within the LL containment range from 672 μmhos/cm to 908 μmhos/cm in the southeast corner to approximately 2,900 μmhos/cm at LW-07. Outside the containment, recent conductance value in the shallow monitoring wells are in the range of 900 to 1,500 μmhos/cm.
- **Dissolved oxygen** – oxygen is added to groundwater through recharge and can be depleted by microbial activity. Groundwater at RM-302S is well oxygenated with values consistently above or near 1.0 mg/L. Most leachate wells show similar results except LW-07 has two values that suggest depleted oxygen conditions (≤0.5 mg/L).
- **pH** – The pH of the UGU groundwater at RM-302S is consistently above 7.0. Most of the leachate samples are slightly lower with some samples being slightly acidic (e.g. 6.02 at LH-06 and 6.3 at LW-07. These values may indicate periodic reducing conditions.
- **eH** – eH is a reliable field test for reducing conditions. eH values in the UGU measured at RM-302S were largely in the 20's mV, with one value of 113 mV. Most of the leachate values are negative numbers suggesting slightly reducing conditions, as would be expected for leachate that accumulates slowly and is not readily replenished by precipitation.
- **Turbidity** – turbidity is also a good indicator of waters that have accumulated precipitates or suspended solids that are often associated with microbial process or the dissolution of metals. Turbidity values at RM-302S accordingly are low, ranging from zero to 6 NTUs. The leachate values are typically higher with over half the values above 10 NTUs.

2.2.1 Discussion

While the LL leachate contains some of the CVOCs found in the underlying groundwater, it also contains aromatic compounds (benzene, toluene, ethylbenzene, and xylenes) as well as ketones (acetone, 2-butanone). Only benzene is currently detected in the groundwater outside the containment system. The benzene concentrations have decreased since 2000 from 3.3 μg/L to 3.4 μg/L at RM-707S and RM-208S, respectively, to near the detection limit (0.5 μg/L) in 2014. The CVOCs that are found in the leachate differ from those found in the bedrock aquifer. The groundwater in the bedrock is dominated by parent compounds TCE and 1,1,1, TCA, while the CVOCs found in the LL leachate are primarily products of microbial reductive dechlorination of the parent compounds (cis-1,2-DCE and vinyl chloride). Field parameters confirm that the geochemical environment inside the LL is reducing and likely supports a healthy microbial population that is reducing CVOCs that were present in the aquifer when the site was contained. Moreover, with wastes being placed at the LL over 40 years ago, the porous nature of the bedrock and a head differential of 40 feet between the UGU and bedrock aquifer, LL leachate constituents should have reached the bedrock aquifer long ago. The lack of aromatic compounds, ketones, or elevated breakdown products indicates the CU has remained an effective barrier to constituents from the LL to the bedrock aquifer.

LL leachate samples from LH-06 contained 14 different VOCs. Samples from LH-07 detect low concentrations of similar constituents, but no CVOCs. Leachate samples from LW-01 detect very low concentrations of chlorobenzene and nothing else. The dissimilarity of constituents in these three wells located in the southeast corner of the LL suggests the leachate is not generated from the same source, and the wells may not share a common hydrologic connection.

The most likely source of VOCs in the leachate, may also account for the abrupt changes in water levels. Unlike all other LL wells, LH-06 and LH-07 have screened intervals in direct contact with the buried waste. Wastes are likely a more permeable material than the surrounding materials and may accumulate infiltrating precipitation causing it to periodically accumulate in LH-06 and LH-07.

LW-07 is located on the west side of the LL and was sampled under this investigation because it had previously contained concentrations of VOCs above the WDNR ES and the leachate was suspected of prolonged contact with the landfill waste. Additional analytical data was collected for this study to compare to previous data to determine if longer contact of the leachate with the waste would result in increasing concentrations of VOCs. Leachate from LW-07 contains low concentrations of breakdown products of 1,1,1-TCA, but no detections of chlorinated ethenes or their breakdown products. Benzene concentrations in the LW-07 samples consistently exceed the ES, unlike other leachate samples that have sporadic exceedances. Importantly, the concentrations of VOCs in the 2014/2015 samples showed no evidence of increasing concentrations during the 13-month contact time of leachate with the landfill waste; with concentrations of chloroethane and xylenes actually decreasing.

Section 3
Recommendations

Monthly leachate level monitoring and five successive quarterly samples of the LL leachate reveal that the internal hydrology and distribution of constituents is varied and reflects heterogeneity in the waste. The most significant conclusion, however, is that concentrations of VOCs in the leachate have decreased markedly since samples were first collected (RMT, 2000). There are no obvious groundwater impacts outside the slurry wall and CU barrier that appear to be related to the LL leachate. Although potential integrity gaps have been documented in the slurry wall at the southeast corner of the LL, there are no data to support there is transport of site-related constituents from the LL through these gaps. The water balance model has not precisely accounted for all fluid inputs and outputs to the LL. However, leachate level monitoring is a better measure of the LL performance than a water balance.

Pumping at LW-07 also has no apparent impact on the gradual rise in leachate levels elsewhere in the LL. Leachate levels within the LL containment system have risen gradually since the extraction system was shut down. With the continued degradation of constituents within the leachate, there is no apparent benefit to operating the leachate extraction system. Monitoring of the shallow groundwater adjacent to the LL should continue in accordance with the Environmental Monitoring Plan (EMP) to determine if leachate levels will continue to rise and document any changes to the leachate chemistry. The leachate level and chemistry data should also be evaluated on an annual basis and compared with groundwater data in the annual Progress Reports. Results of this study should be considered by USEPA and WDNR in proceeding with an ESD to allow no further leachate extraction at the LL.

Section 4
References

RMT, 2000. Leachate head monitoring well sampling results. Lemberger Landfill Site. Franklin Township, Wisconsin. September 2000.

RMT, 2007. Leachate head evaluation report for the Lemberger Landfill. Prepared for Lemberger Site Remediation Group. October 2007.

RMT, 2010. Leachate evaluation report for the Lemberger Landfill. February 2010.

RMT. 2011. Leachate head evaluation report for the Lemberger Landfill. June 2011.

USEPA. 2010. Third five-year review report for Lemberger Landfill (Lemberger Fly Ash) Lemberger Transport and Recycling, Franklin Township, Manitowoc County, Wisconsin. July 2010.

Table 1
Southeast Corner Analytical Summary – Volatile Organic Compounds
Lemberger Landfill

PARAMETER	MCL OR ES	LH-06 7/13/2000	LH-06 5/29/2014	LH-06 4/1/2015	LH-07 7/13/2000	LH-07 5/29/2014	LH-07 10/5/2014	LW-01 5/29/2014	LW-01 10/5/2014	LW-01 12/23/2014	LW-01 4/1/2015	LW-01 6/29/2015
1,1,1-Trichloroethane	200	**380 D**	0.72 J	< 5.0	< 0.53	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1,2-Trichloroethane	5	**6.8**	< 0.16	< 2.0	< 0.47	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.20	< 0.20
1,1-Dichloroethane	850	**1200 D**	31.3	33.5	< 0.61	< 0.18	0.32 J	< 0.18	< 0.24	< 0.24	< 0.24	< 0.24
1,1-Dichloroethene	7	2.8	< 0.41	< 4.1	< 0.47	< 0.41	< 0.41	< 0.41	< 0.41	< 0.41	< 0.41	< 0.41
1,2-Dichloroethane	5	**35**	1.1	**7.7 J**	< 0.54	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17
1,2-Dichloroethene, total	NS	**10000 D**	--	--	2.3 Q	--	--	--	--	--	--	--
1,2-Dichloropropane	5	**5.6**	< 0.23	< 2.3	< 0.34	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23
2-Butanone	4,000	78	< 3.0	43.2 J	3.1 Q	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
2-Hexanone	NS	18	< 1.1	< 11.1	< 0.61	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
4-Methyl-2-pentanone	500	57	< 2.1	< 21.4	< 0.61	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1
Acetone	9,000	< 3.1	7.5 J	2200	520 D	< 3.0	74.5	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Benzene	5	**75**	0.98 J	**71.7**	**11**	< 0.50	1.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbon disulfide	1,000	1.4	< 0.51	< 6.1	< 0.40	< 0.51	< 0.61	< 0.51	< 0.61	< 0.61	< 0.61	< 0.61
Chlorobenzene	100	< 0.43	< 0.50	< 5.0	7.6	< 0.50	0.53 J	0.82 J	0.76 J	0.50 J	0.76 J	0.62 J
Chloroethane	400	21	< 0.37	< 3.7	< 0.63	< 0.37	< 0.37	< 0.37	< 0.37	< 0.37	< 0.37	< 0.37
Chloromethane	NS	1.3 Q	< 0.50	< 5.0	< 0.44	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
cis-1,2-Dichloroethene	70	--	**293**	**141**	--	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26
Ethylbenzene	700	160	< 0.50	59.3	59	< 0.50	0.69 J	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Methylene chloride	5	**9600 D**	2.6 u	< 2.3	< 0.38	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23
Tetrachloroethene	5	**6.8**	1.1	< 5.0	< 0.41	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Toluene	800	610 D	0.90 J	18.6	1.1 Q	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
trans-1,2-Dichloroethene	100	--	1.8	3.1 J	--	< 0.24	< 0.26	< 0.24	< 0.26	< 0.26	< 0.26	< 0.26
Trichloroethene	5	**47**	1.7	< 3.3	< 0.49	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Vinyl chloride	0.2	**290 D**	**12.8**	< 1.8	< 0.17	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18
Xylene, total	2,000	560 D	< 1.5	163	57	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5

Notes:
All values in µg/L.
Only parameters that were detected in at least one sample are included in the table.
Bold font denotes regulatory (ES) exceedence .
u = constituent is considered "not detected" due to blank contamination.
J and Q = estimated value below limit of quantitation.
D = sample diluted.
For other laboratory qualifiers, refer to specific laboratory data reports.
-- indicates the analyte was not reported for that sample.
NS = no standard.
LH-06 was dry on 10/5/2014, 12/23/14, and 6/29/15.
LH-07 was dry on 12/23/04, 4/1/15, and 6/29/15.

Table 1
Southeast Corner Analytical Summary – Volatile Organic Compounds
Lemberger Landfill

PARAMETER	MCL OR ES	LW-07 8/3/2010	LW-07 5/29/2014	LW-07 10/5/2014	LW-07 12/23/2014	LW-07 4/1/2015	LW-07 6/29/2015	RM-302S 7/19/2000	RM-302S 5/29/2014	RM-302S 10/6/2014	RM-302S 12/23/2014	RM-302S 4/1/2015	RM-302S 6/29/2015
1,1,1-Trichloroethane	200	< 0.9	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.53	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1,2-Trichloroethane	5	< 0.42	< 0.16	< 0.16	< 0.16	< 0.20	< 0.20	< 0.47	< 0.16	< 0.16	< 0.16	< 0.20	< 0.20
1,1-Dichloroethane	850	1.2	1.5	0.96 J	0.94 J	0.76 J	0.61 J	< 0.61	< 0.18	< 0.24	< 0.24	< 0.24	< 0.24
1,1-Dichloroethene	7	< 0.57	< 0.41	< 0.41	< 0.41	< 0.41	< 0.41	< 0.47	< 0.41	< 0.41	< 0.41	< 0.41	< 0.41
1,2-Dichloroethane	5	< 0.36	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.54	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17
1,2-Dichloroethene, total	NS	--	--	--	--	--	--	< 0.90	--	--	--	--	--
1,2-Dichloropropane	5	< 0.49	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.34	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23
2-Butanone	4,000	< 4.3	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 1.2	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
2-Hexanone	NS	< 2	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 0.61	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
4-Methyl-2-pentanone	500	< 1.2	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1	< 0.61	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1
Acetone	9,000	7.1 J	< 3.0	< 3.0	6.0 J	5.0 J	< 3.0	< 3.1	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Benzene	5	**9.9**	**9.2**	**12.5**	**10.9**	**8.1**	**8.0**	< 0.44	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbon disulfide	1,000	< 0.66	< 0.51	< 0.61	< 0.61	< 0.61	< 0.61	< 0.40	< 0.51	< 0.61	< 0.61	< 0.61	< 0.61
Chlorobenzene	100	0.80 J	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.43	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chloroethane	400	47.0	31.3	25.0	22.7	21.6	15.6	< 0.63	< 0.37	< 0.37	< 0.37	< 0.37	< 0.37
Chloromethane	NS	< 0.24	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.44	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
cis-1,2-Dichloroethene	70	< 0.83	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	--	< 0.26	< 0.26	< 0.26	< 0.26 M1j	< 0.26
Ethylbenzene	700	< 0.54	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Methylene chloride	5	1.8 Z3	1.1 u	0.87 Ju	0.85 J	0.85 J	0.51 J	< 0.38	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23
Tetrachloroethene	5	< 0.45	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.41	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Toluene	800	< 0.67	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.40	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
trans-1,2-Dichloroethene	100	< 0.89	< 0.24	< 0.26	< 0.26	< 0.26	< 0.26	--	< 0.24	< 0.26	< 0.26	< 0.26	< 0.26
Trichloroethene	5	< 0.48	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.49	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Vinyl chloride	0.2	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.17	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18
Xylene, total	2,000	39.4	26.3	6.5	7.4	8.5	6.2	< 1.2	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5

Notes:

All values in µg/L.

Only parameters that were detected in at least one sample are included in the table.

Bold font denotes regulatory (ES) exceedence .

u = constituent is considered "not detected" due to blank contamination.

J and Q = estimated value below limit of quantitation.

D = sample diluted.

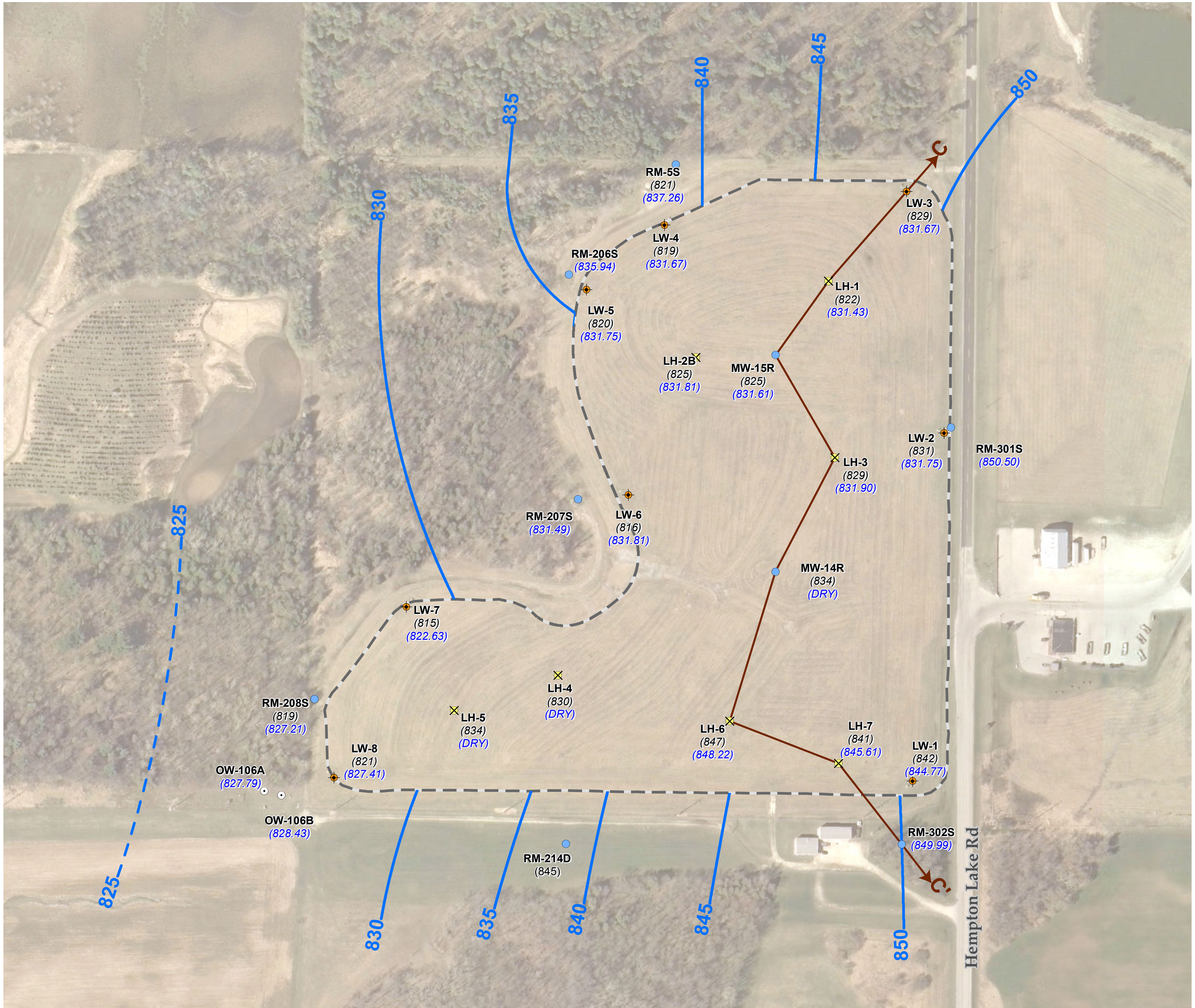
For other laboratory qualifiers, refer to specific laboratory data reports.

-- indicates the analyte was not reported for that sample.

NS = no standard.

LH-06 was dry on 10/5/2014, 12/23/14, and 6/29/15.

LH-07 was dry on 12/23/04, 4/1/15, and 6/29/15.



LEGEND

- GW COLLECTION SUMP (GWC)
- GW EXTRACTION WELL (EW)
- GW OBSERVATION WELL (OW)
- LEACHATE HEAD WELL (LH)
- LEACHATE WITHDRAWL WELL (LW)
- MONITORING WELL (RM)
- SLURRY WALL (APPROXIMATE)
- PERCHED WATER TABLE CONTOURS OUTSIDE OF THE SLURRY WALL (5' INTERVAL, DASHED WHERE INFERRED)
- CROSS SECTION LINES

(NA) NOT APPLICABLE (WELL LOCATED OUTSIDE LANDFILL LIMITS)
(843) TOP NUMBER: TOP OF CU ELEV. FT. MSL
(833.45) BOTTOM NUMBER: AVERAGE POST-SHUTDOWN GROUNDWATER OR LEACHATE ELEV., FT. MSL (1/9-6/15)

NOTES

1. AERIAL IMAGERY FROM MANITOWOC COUNTY, 2010.

0 200 400 FEET
1 " = 200 '
1:2,400

PROJECT:	LEMBERGER LANDFILL TOWN OF FRANKLIN, WISCONSIN
SHEET TITLE:	TOP OF CONFINING UNIT AND GROUNDWATER/LEACHATE ELEVATIONS

DRAWN BY: PAPEZ J	SCALE: 1: 2,400	PROJ. NO. 226573.0007	
CHECKED BY: WEDEKIND J		FILE NO. 226573-023.mxd	
APPROVED BY: KRAUSE K	DATE PRINTED:	FIGURE 1	
DATE: SEPTEMBER 2015			

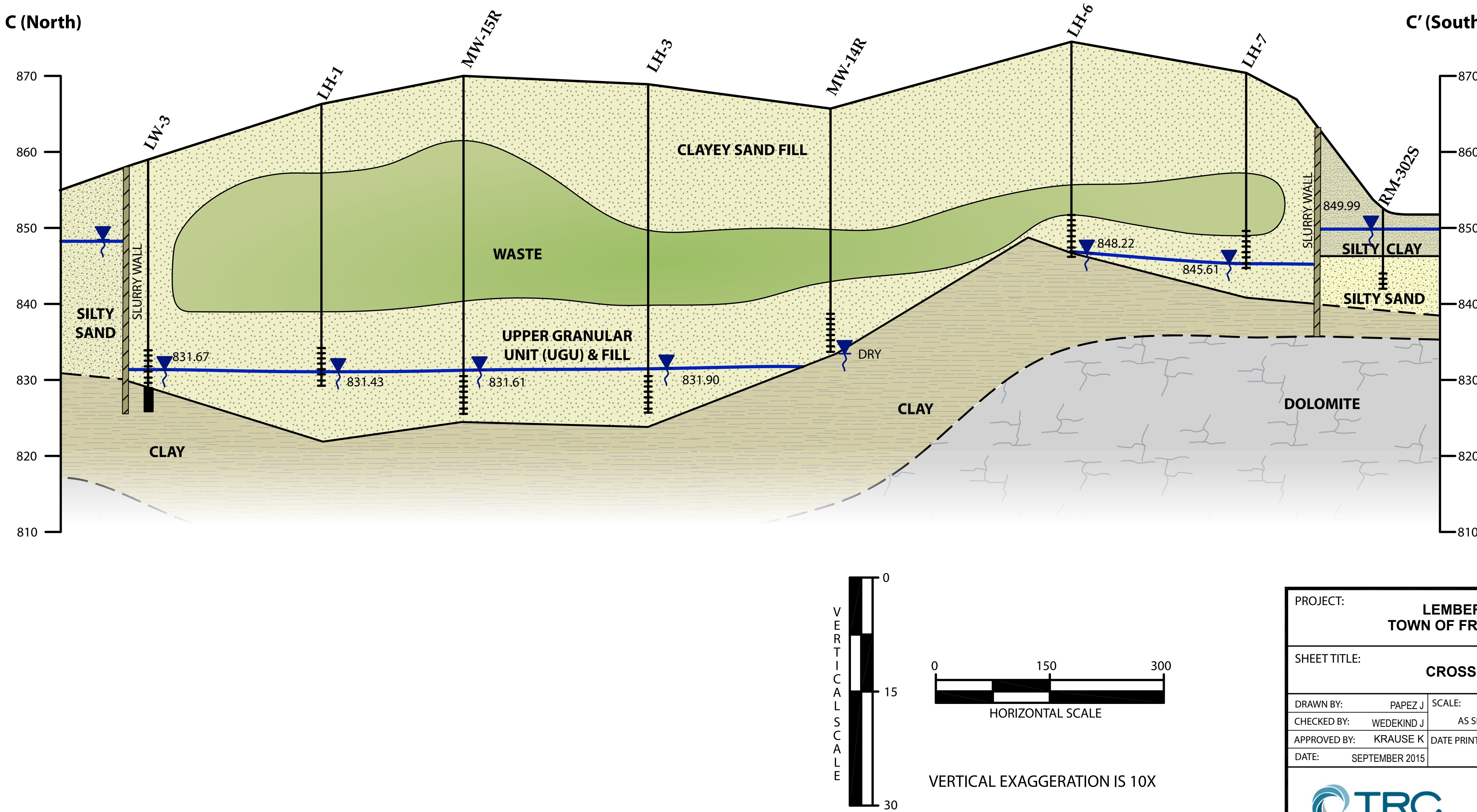
TRC

708 Heartland Trail, Suite 3000
Madison, WI 53717
Phone: 608.826.3600
www.trcsolutions.com

TRC - GIS

Coordinate System: NAD 1983 UTM Zone 16N (Meter)
Map Rotation: 0

Saved By: JPAPEZ on 9/1/2015, 12:51:35 PM
Path: E:\LembergerLandfill\2015_226573\226573-023.mxd



VERTICAL EXAGGERATION IS 10X

CROSS SECTION LEGEND

GEOLOGIC CONTACT

ESTIMATED WASTE BOUNDARY

(848.28) GROUNDWATER OR LEACHATE ELEVATION, ft MSL

WELL SCREEN

3' CLOSED SUMP

CURRENT WATER LEVEL

NOTES

AVERAGE WATER ELEVATIONS MEASURED 1/2009 - 6/2015.

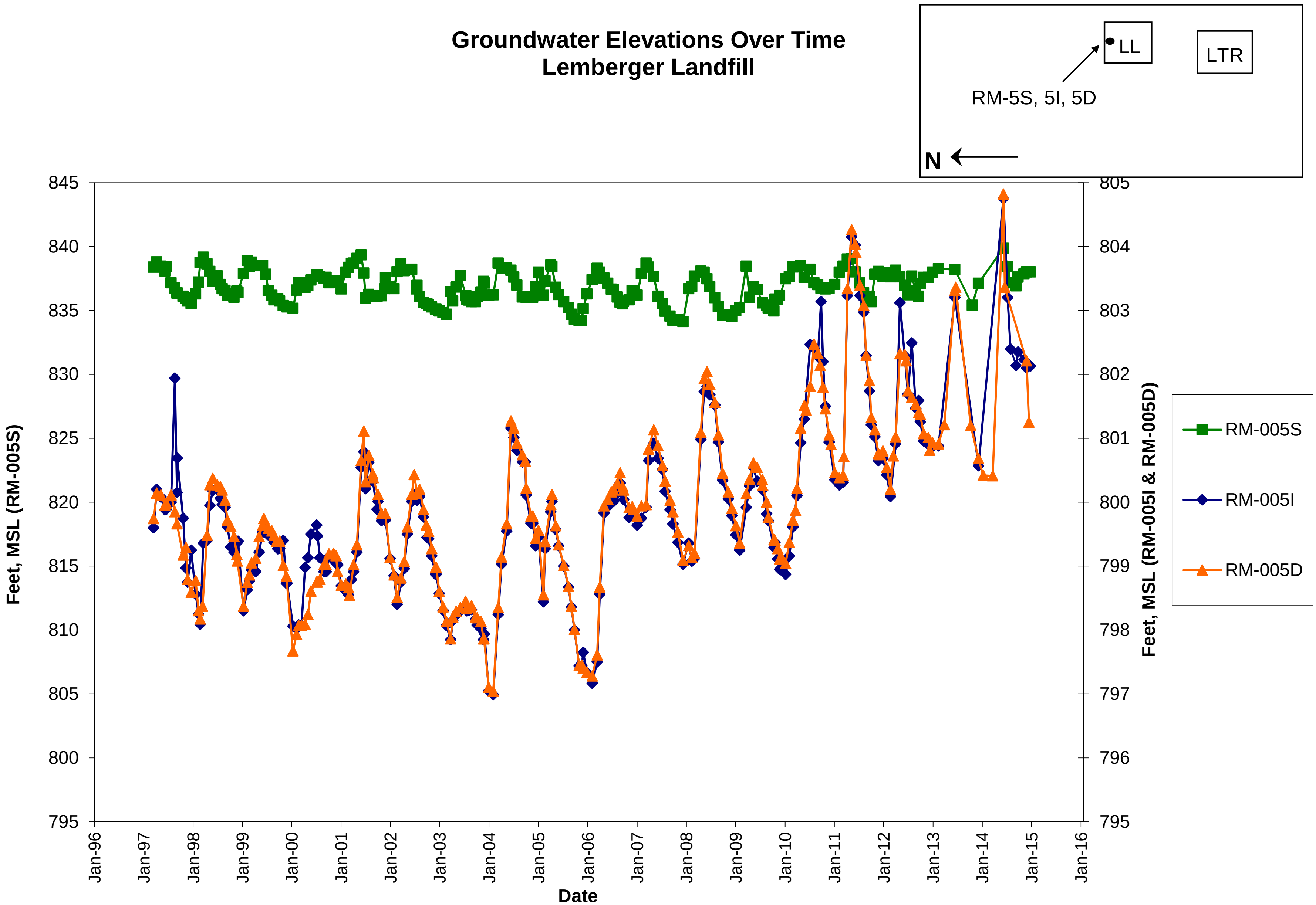
PROJECT:	LEMBERGER LANDFILL TOWN OF FRANKLIN, WISCONSIN		
SHEET TITLE:	CROSS SECTION C-C'		
DRAWN BY: PAPEZ J	SCALE:	PROJ. NO. 226573.0007	
CHECKED BY: WEDEKIND J	AS SHOWN	FILE NO. 226573-004.ai	
APPROVED BY: KRAUSE K	DATE PRINTED:	FIGURE 2	
DATE: SEPTEMBER 2015			

TRC

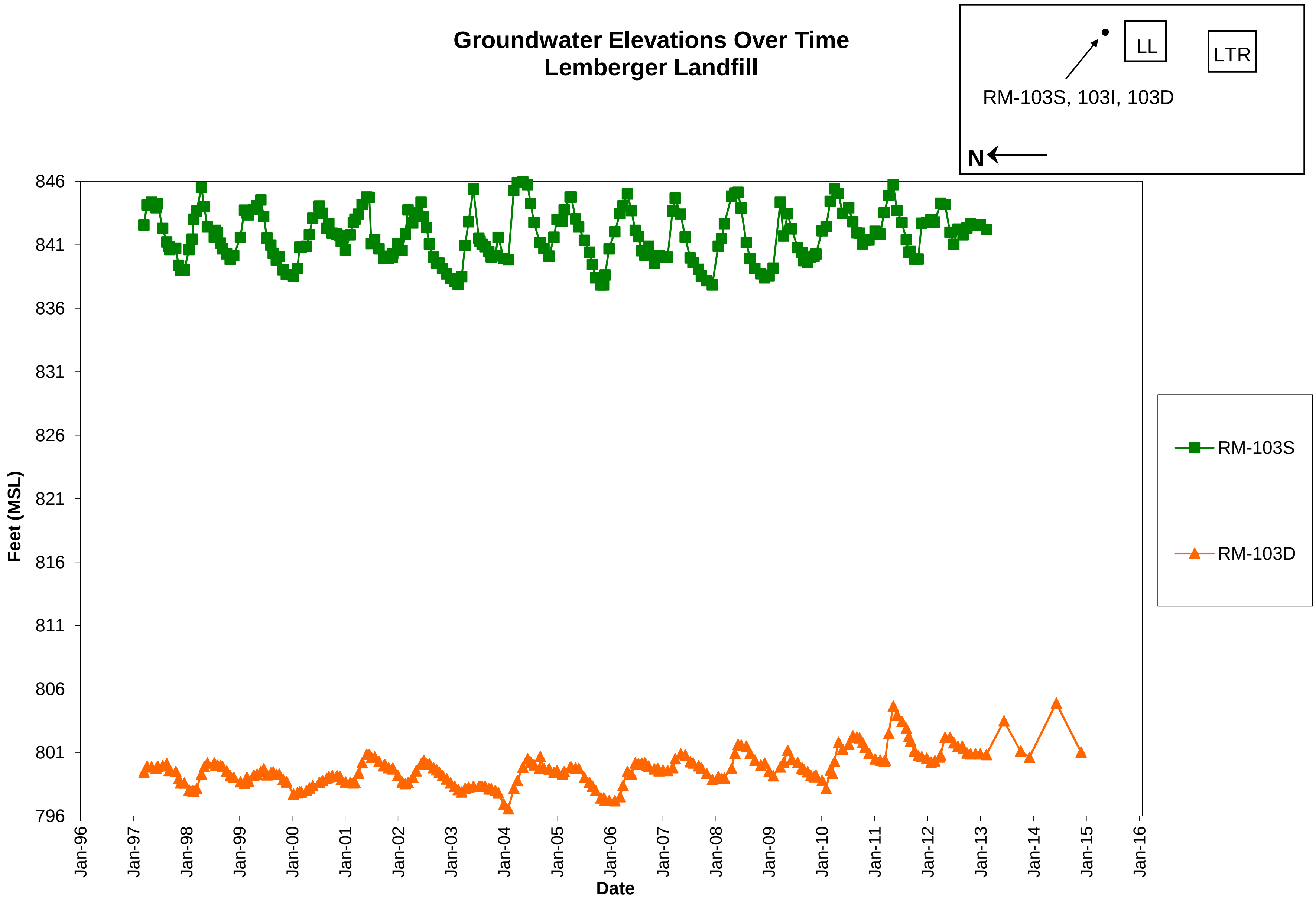
708 Heartland Trail, Suite 3000
Madison, WI 53717
Phone: 608.826.3600
www.trcsolutions.com

E:\LembergerLandfill\2015_226573\Ai\226573-004.ai

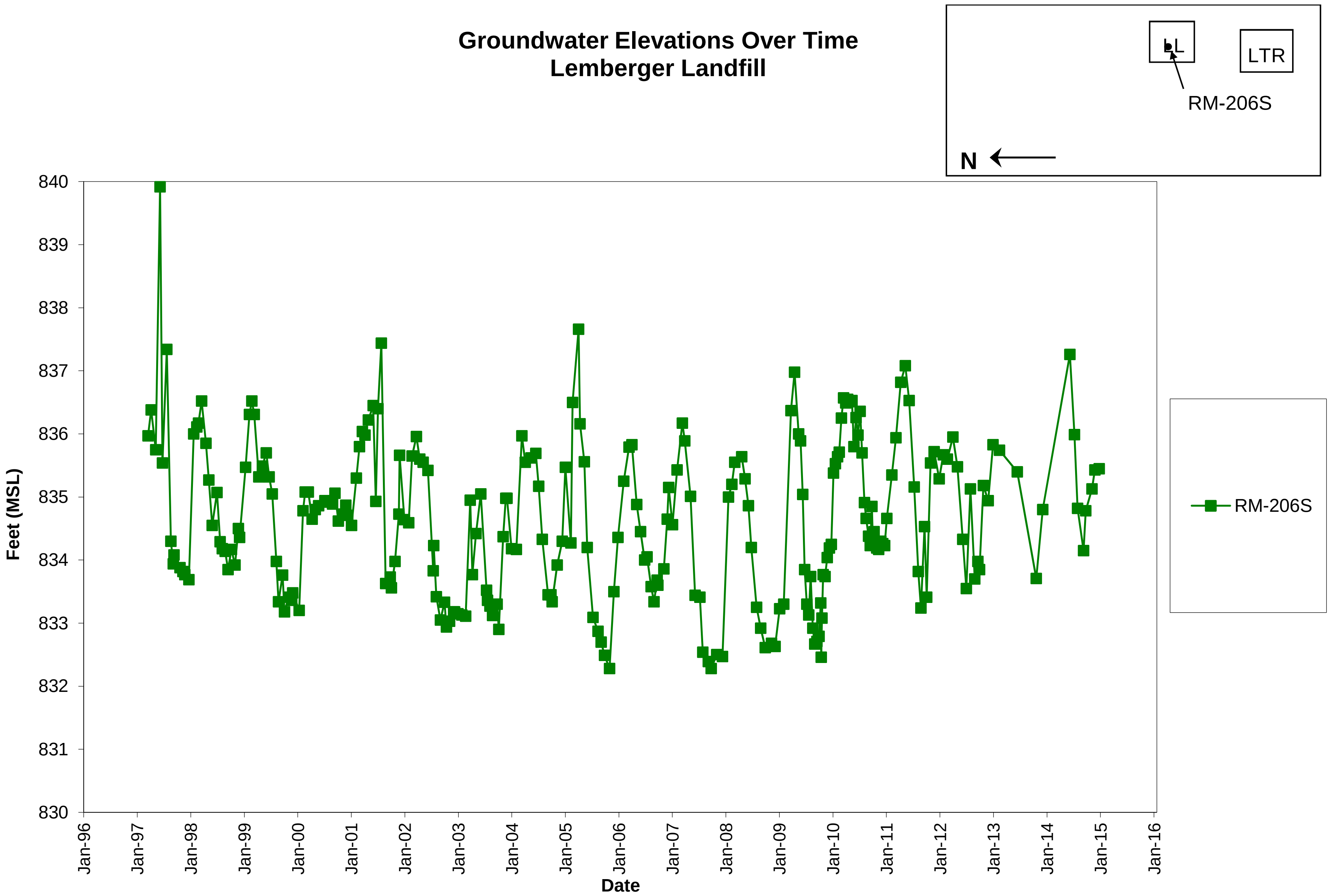
Appendix A
Hydrographs



Groundwater Elevations Over Time
Lemberger Landfill
RM-5S, 5I, 5D
LL
LTR
N
Feet, MSL (RM-005S)
Feet, MSL (RM-005I & RM-005D)
Date
845
840
835
830
825
820
815
810
805
800
795
805
804
803
802
801
800
799
798
797
796
795
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
RM-005S
RM-005I
RM-005D

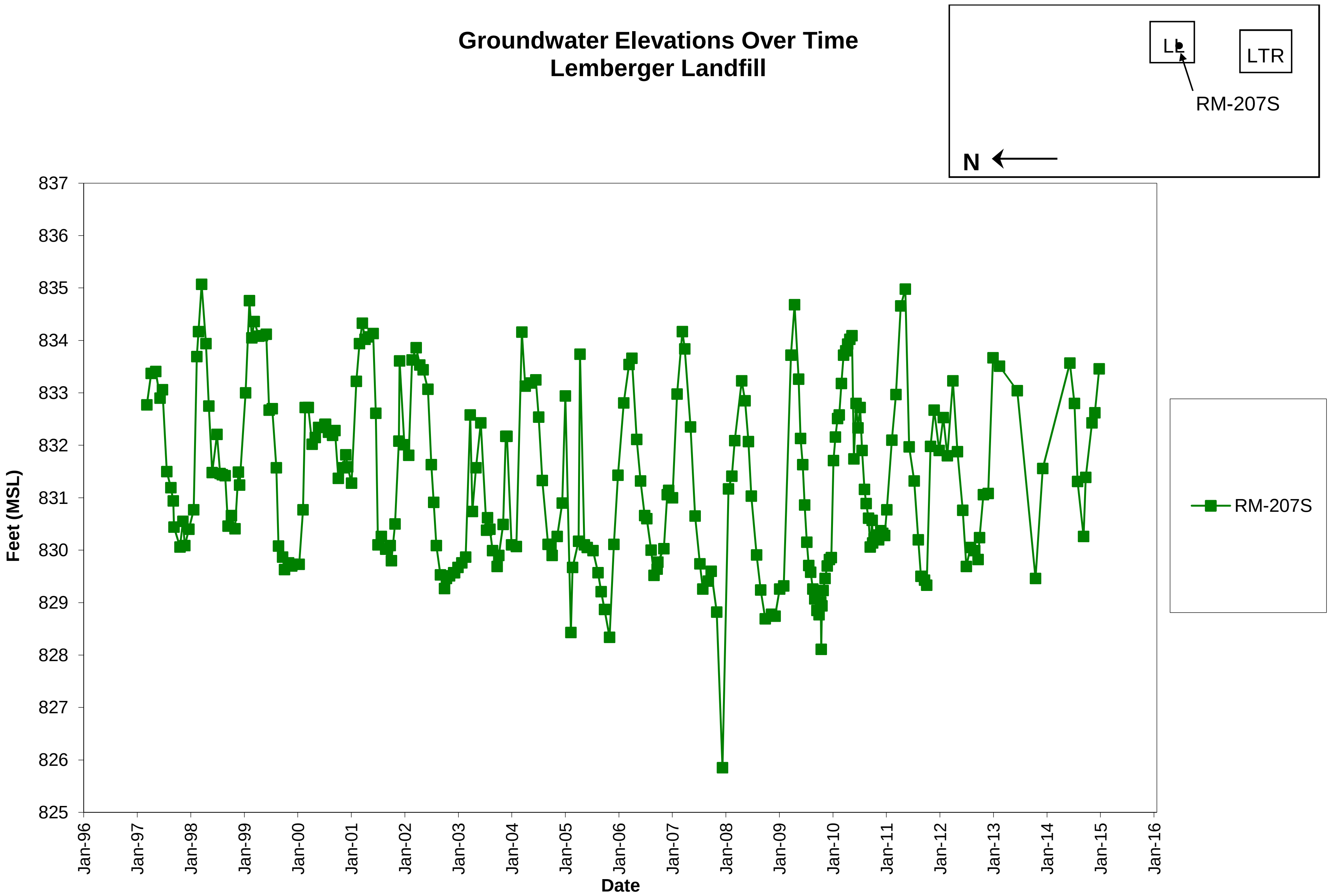


\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-001_Attachment A.xlsx 8/24/2015

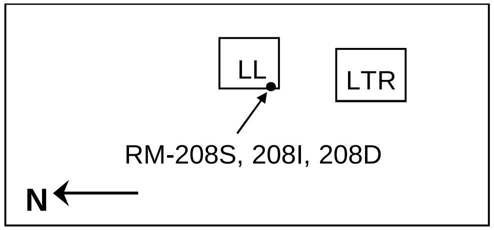


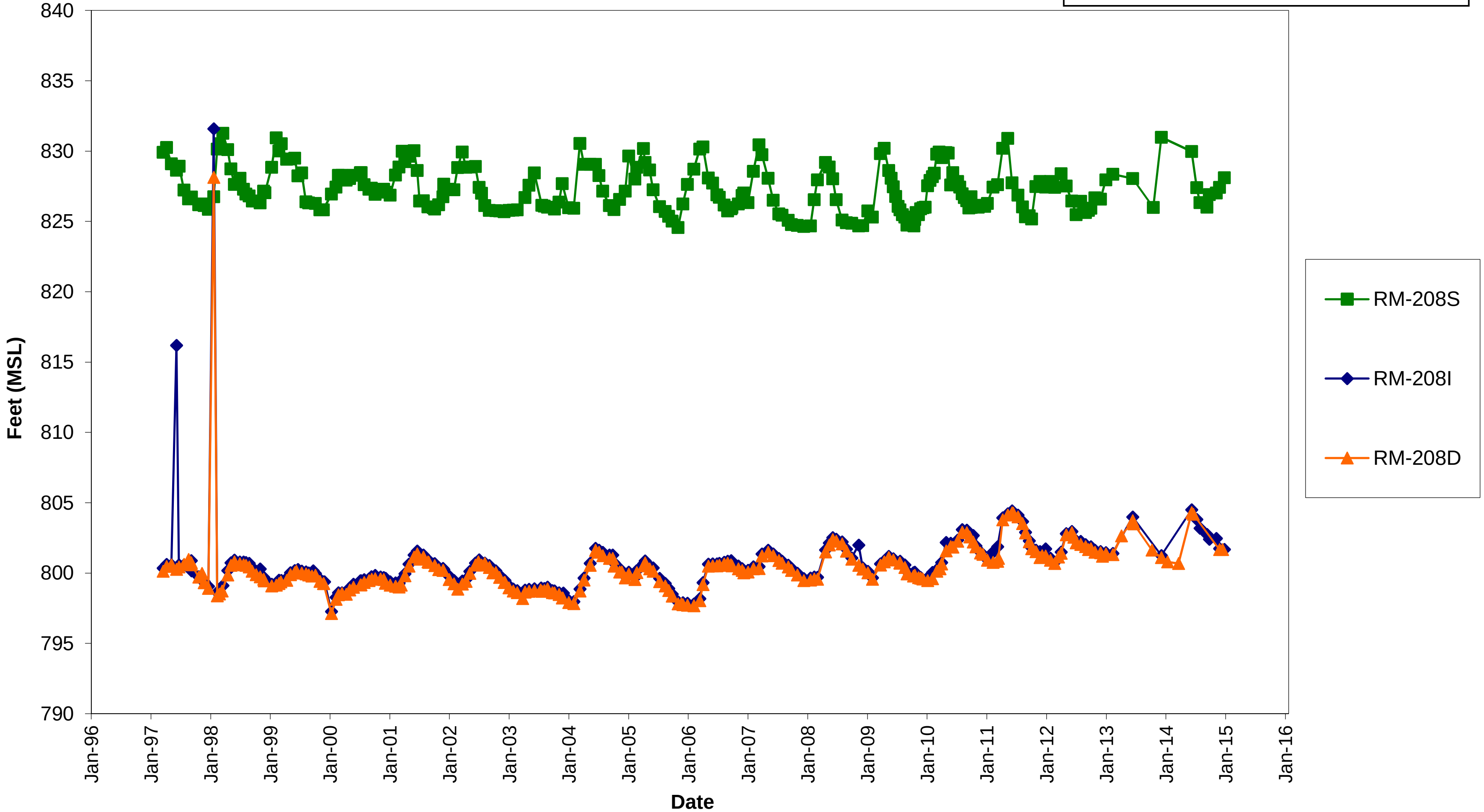
Groundwater Elevations Over Time
Lemberger Landfill
LL
LTR
RM-206S
N
Feet (MSL)
840
839
838
837
836
835
834
833
832
831
830
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Date
RM-206S

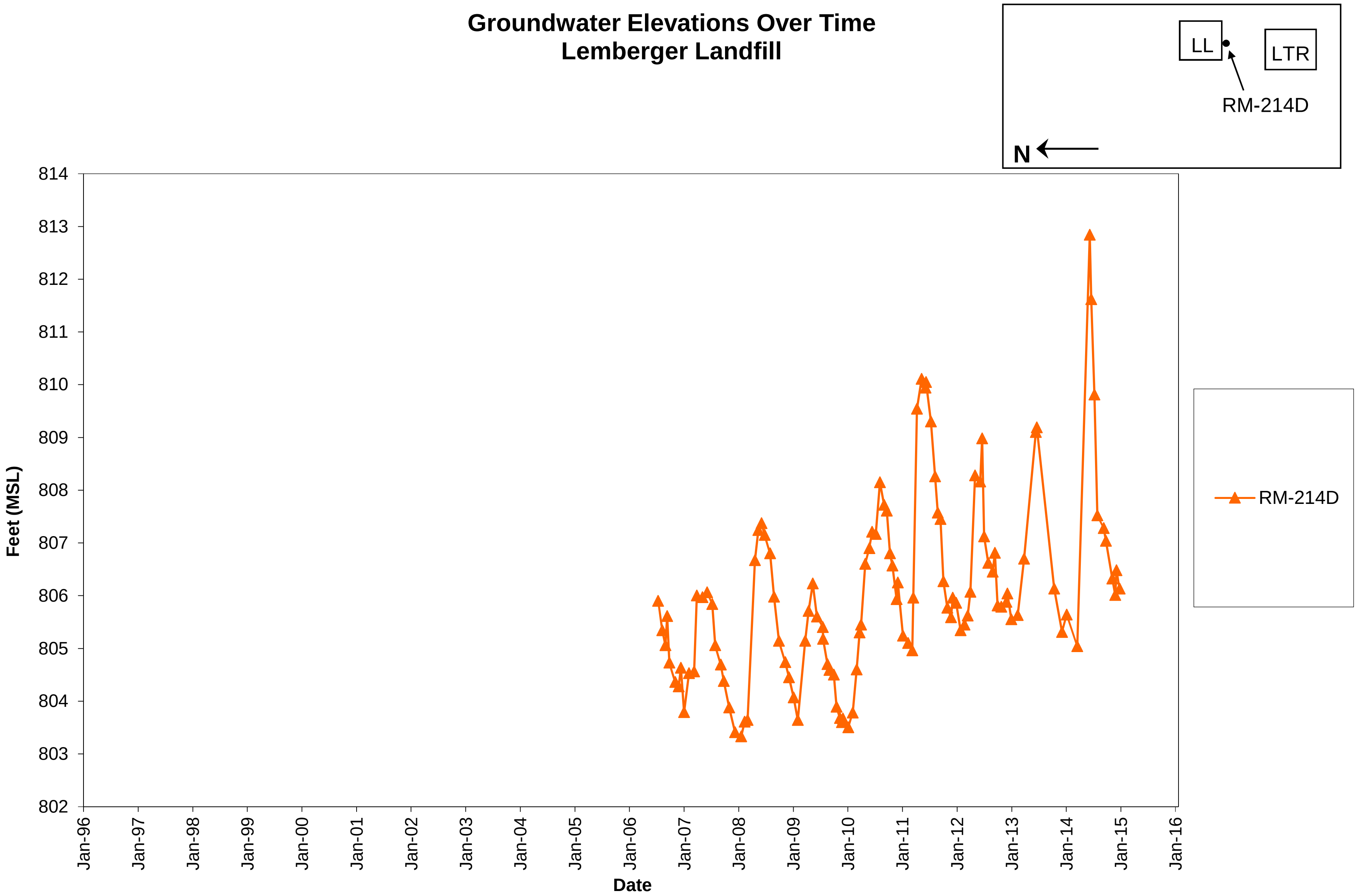
Groundwater Elevations Over Time
Lemberger Landfill



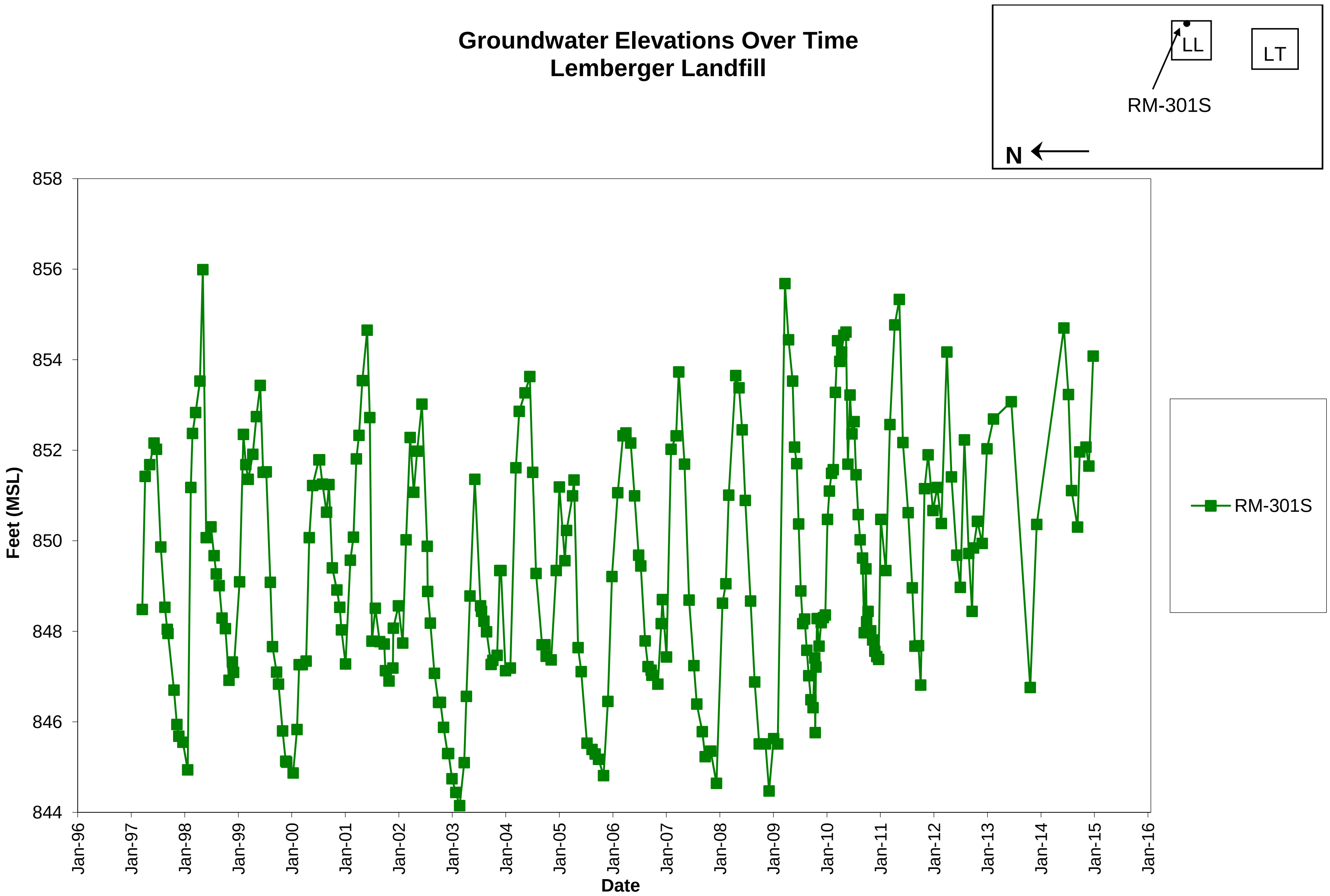
Groundwater Elevations Over Time
Lemberger Landfill



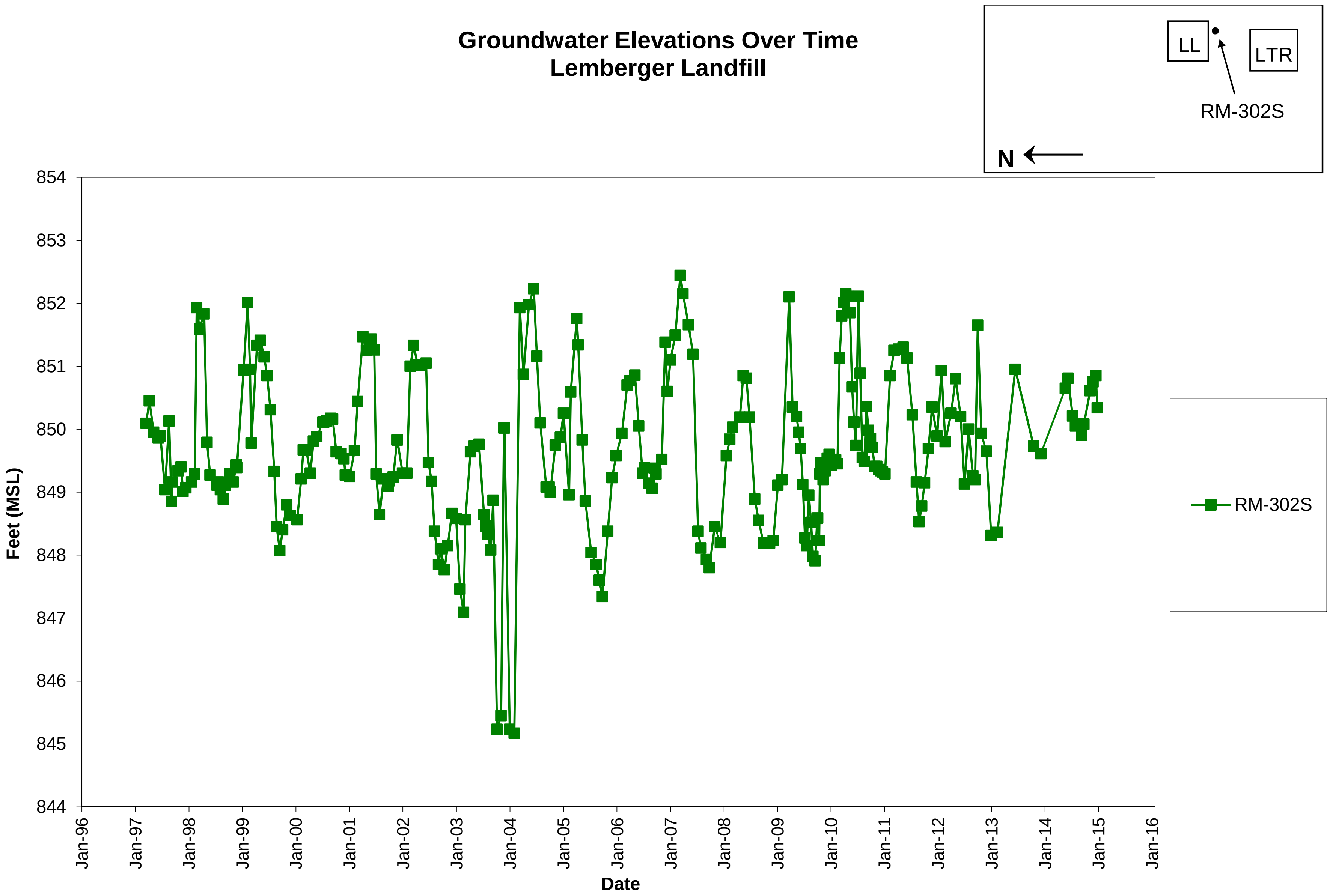




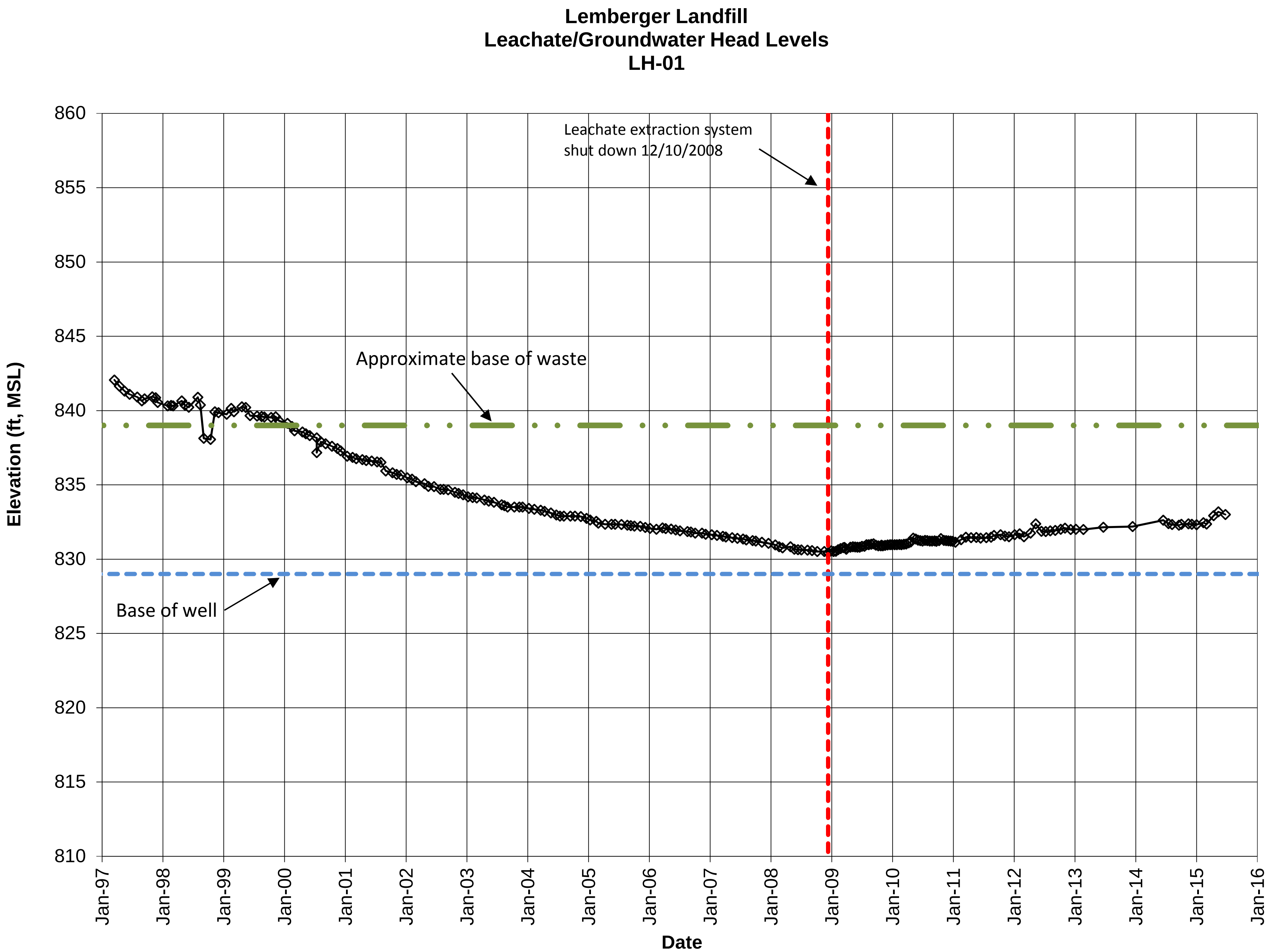
Groundwater Elevations Over Time
Lemberger Landfill
LL
LTR
RM-214D
N
Feet (MSL)
814
813
812
811
810
809
808
807
806
805
804
803
802
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Date
RM-214D



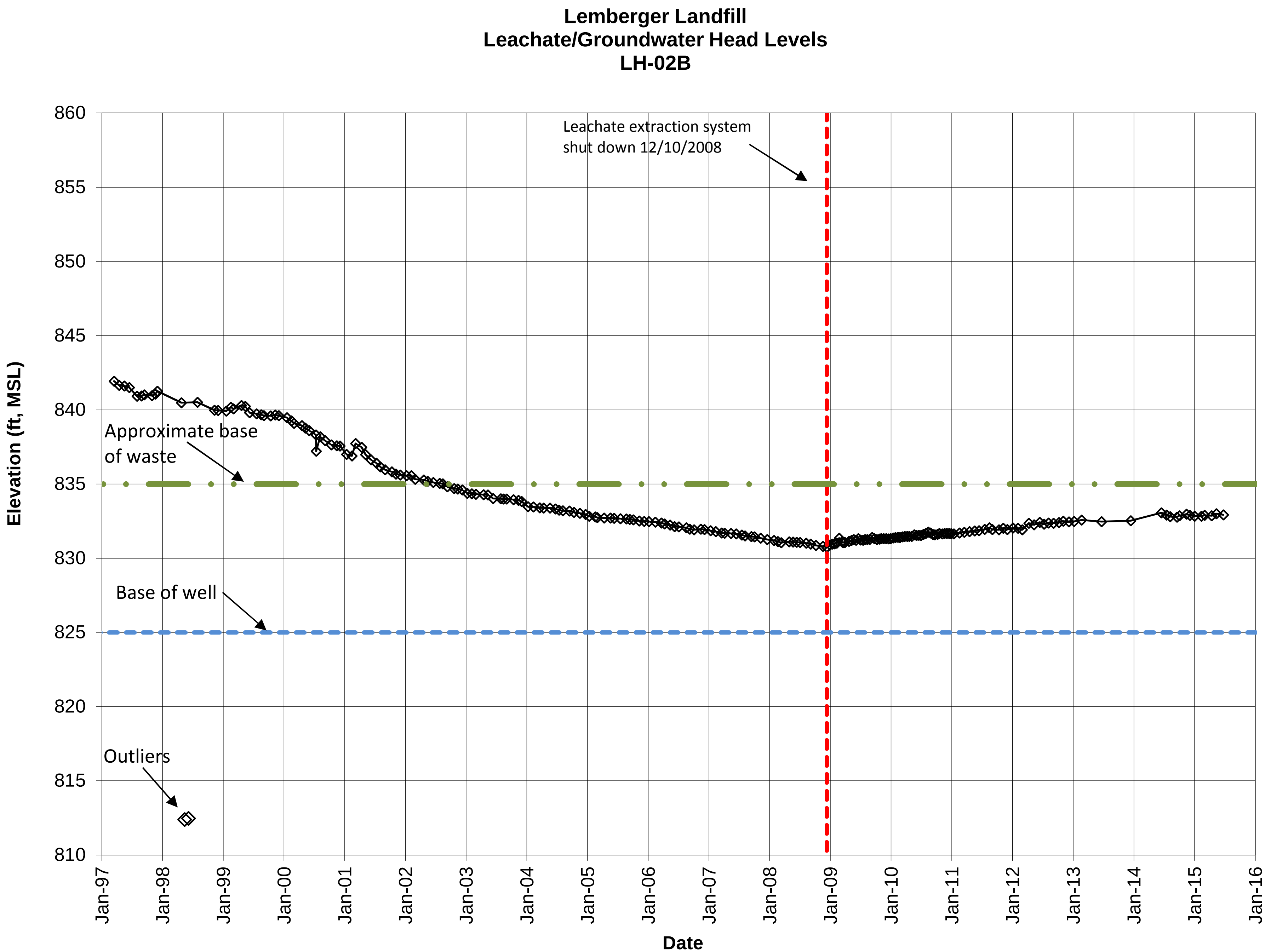
\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-001_Attachment A.xlsx 8/24/2015



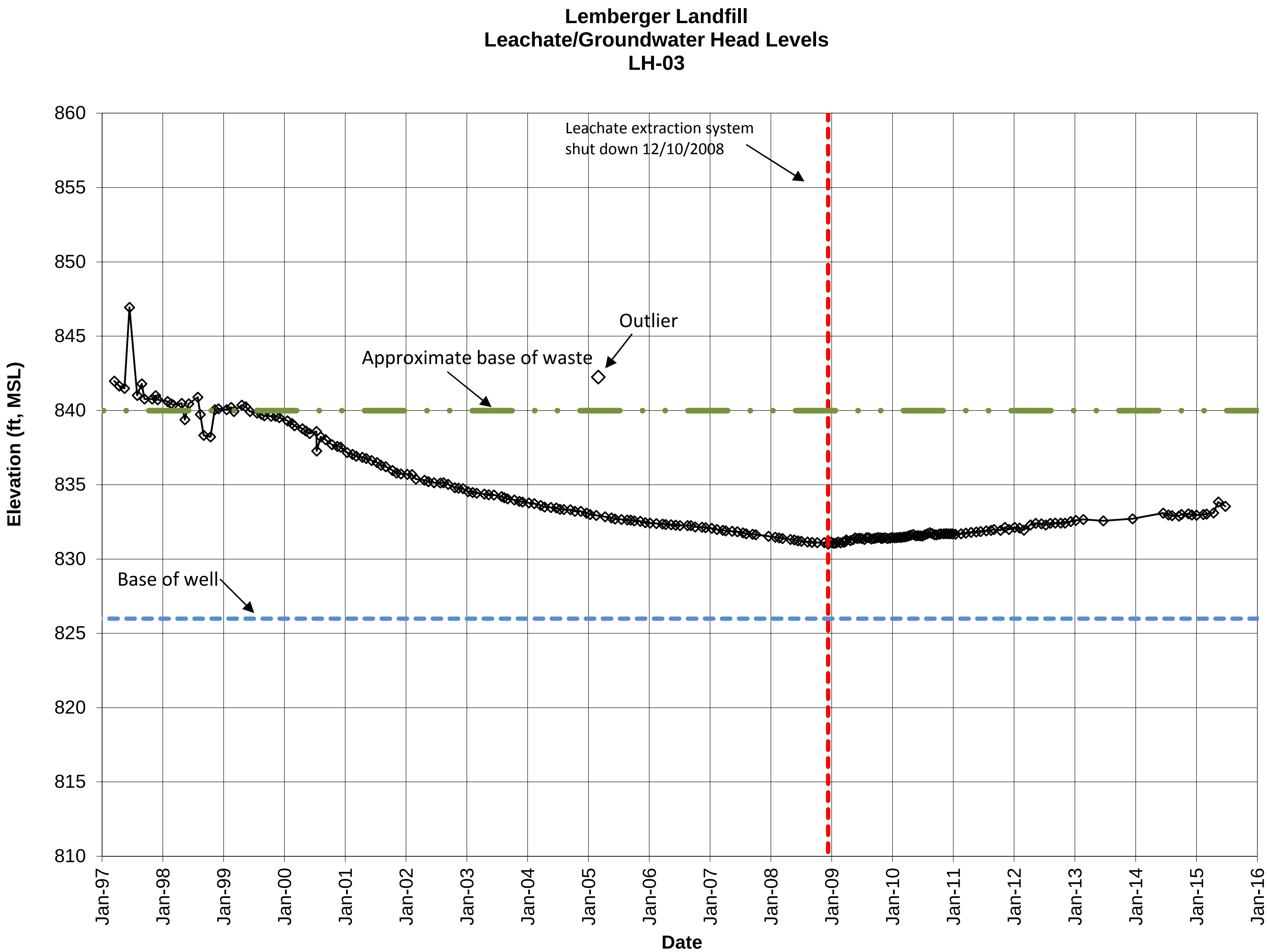
Groundwater Elevations Over Time
Lemberger Landfill
LL
LTR
RM-302S
N
Feet (MSL)
854
853
852
851
850
849
848
847
846
845
844
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Date
RM-302S



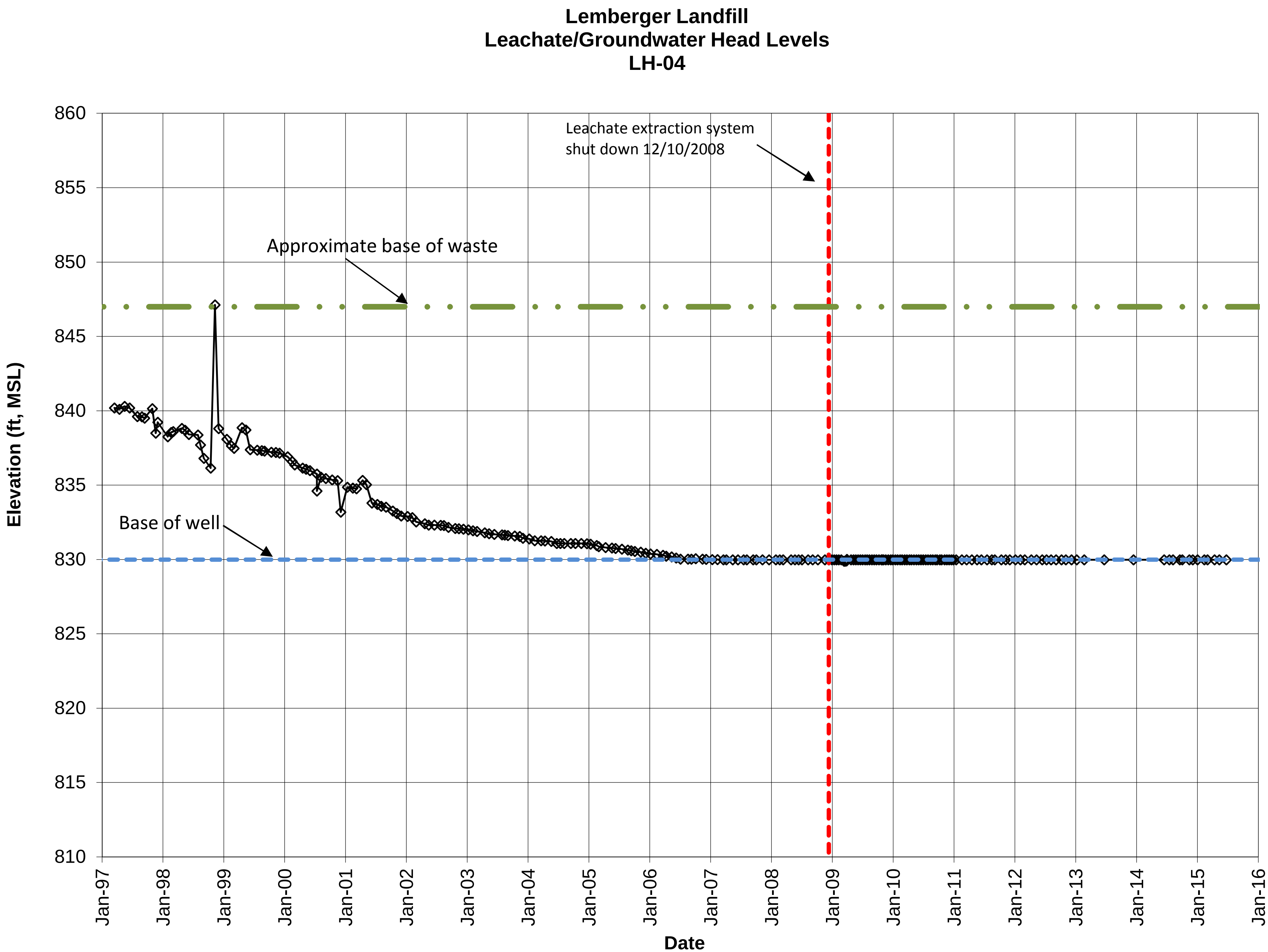
\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-002_Attachment A.xlsx



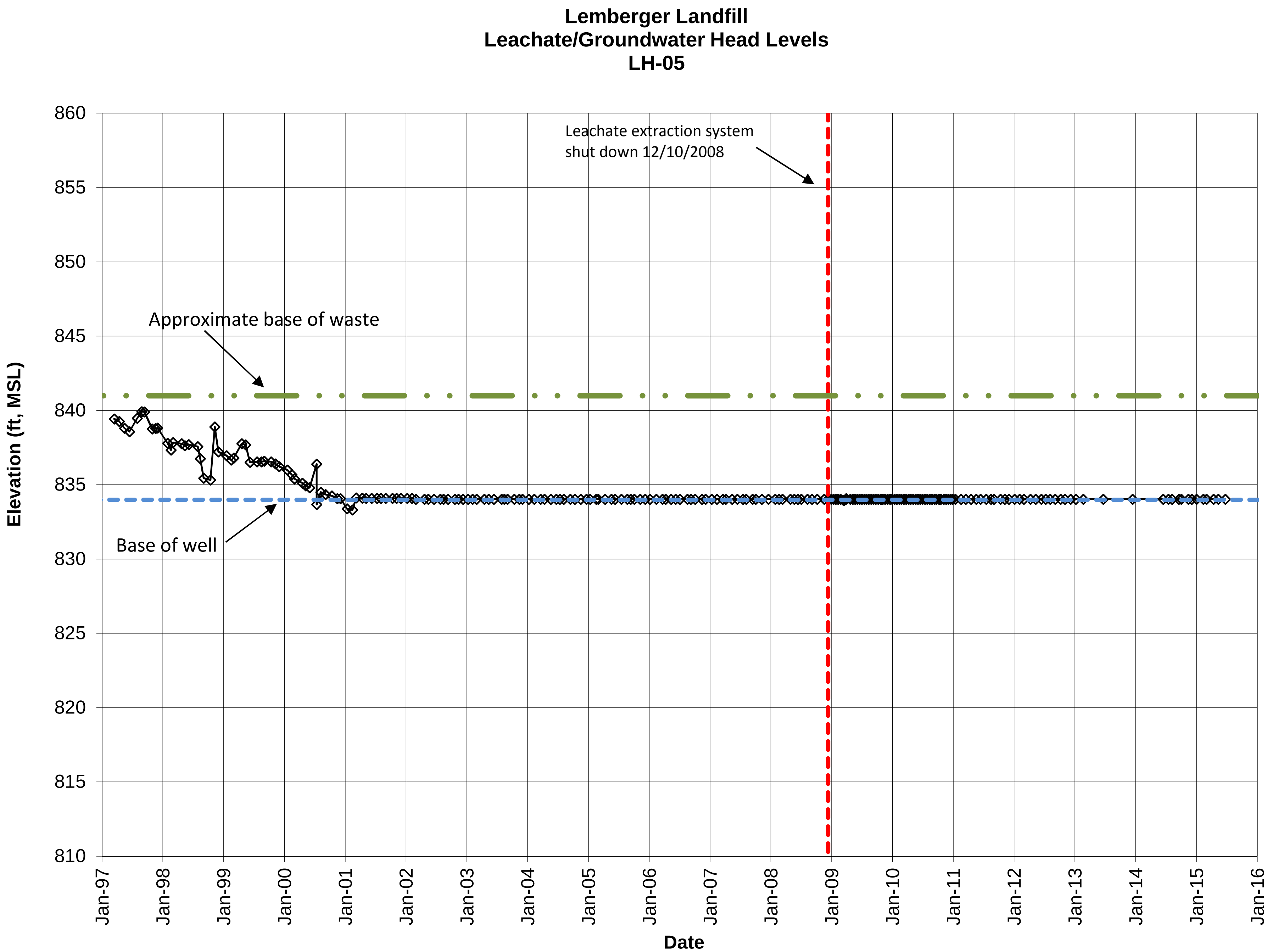
\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-002_Attachment A.xlsx



\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-002_Attachment A.xlsx

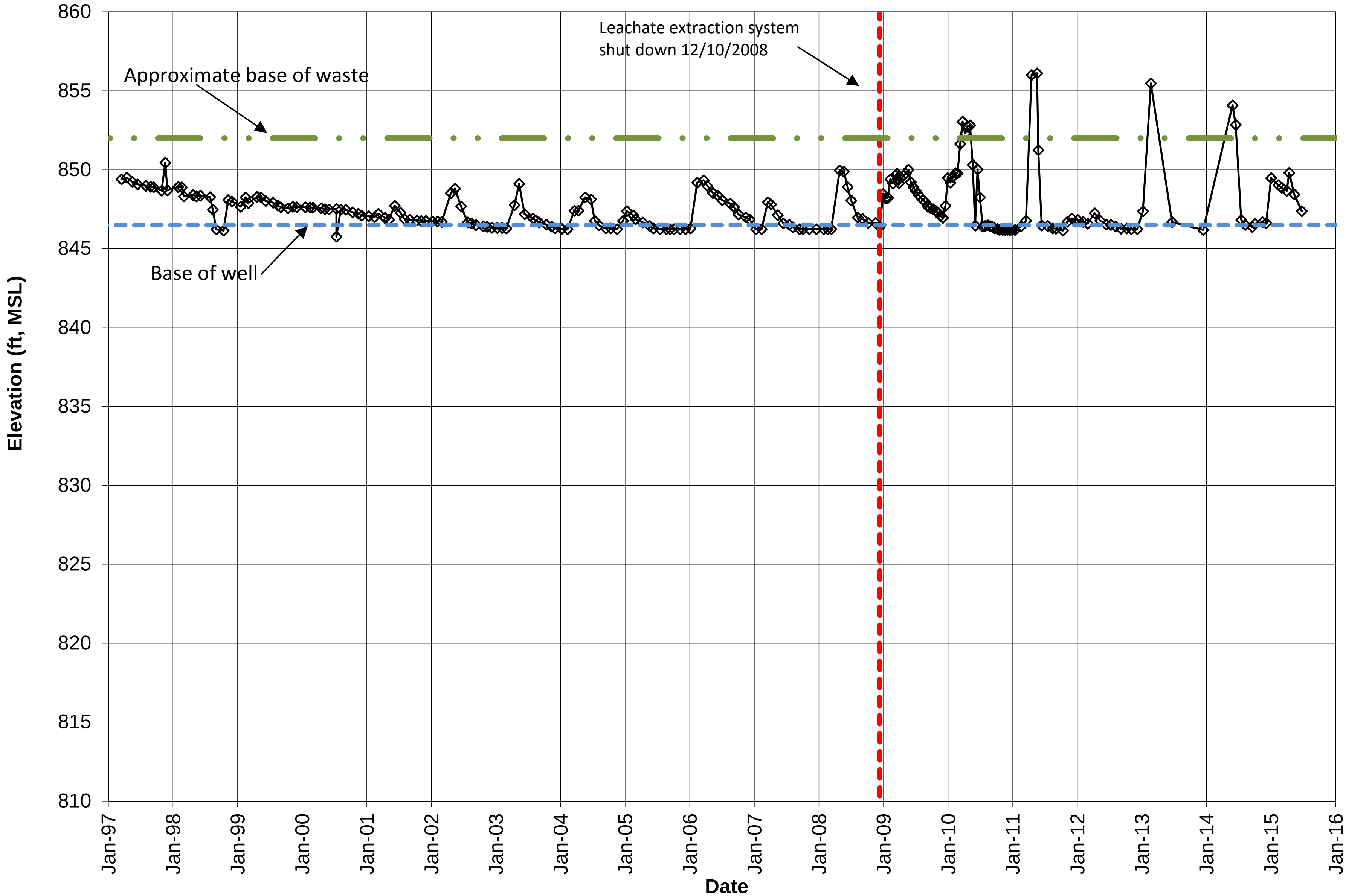


\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-002_Attachment A.xlsx



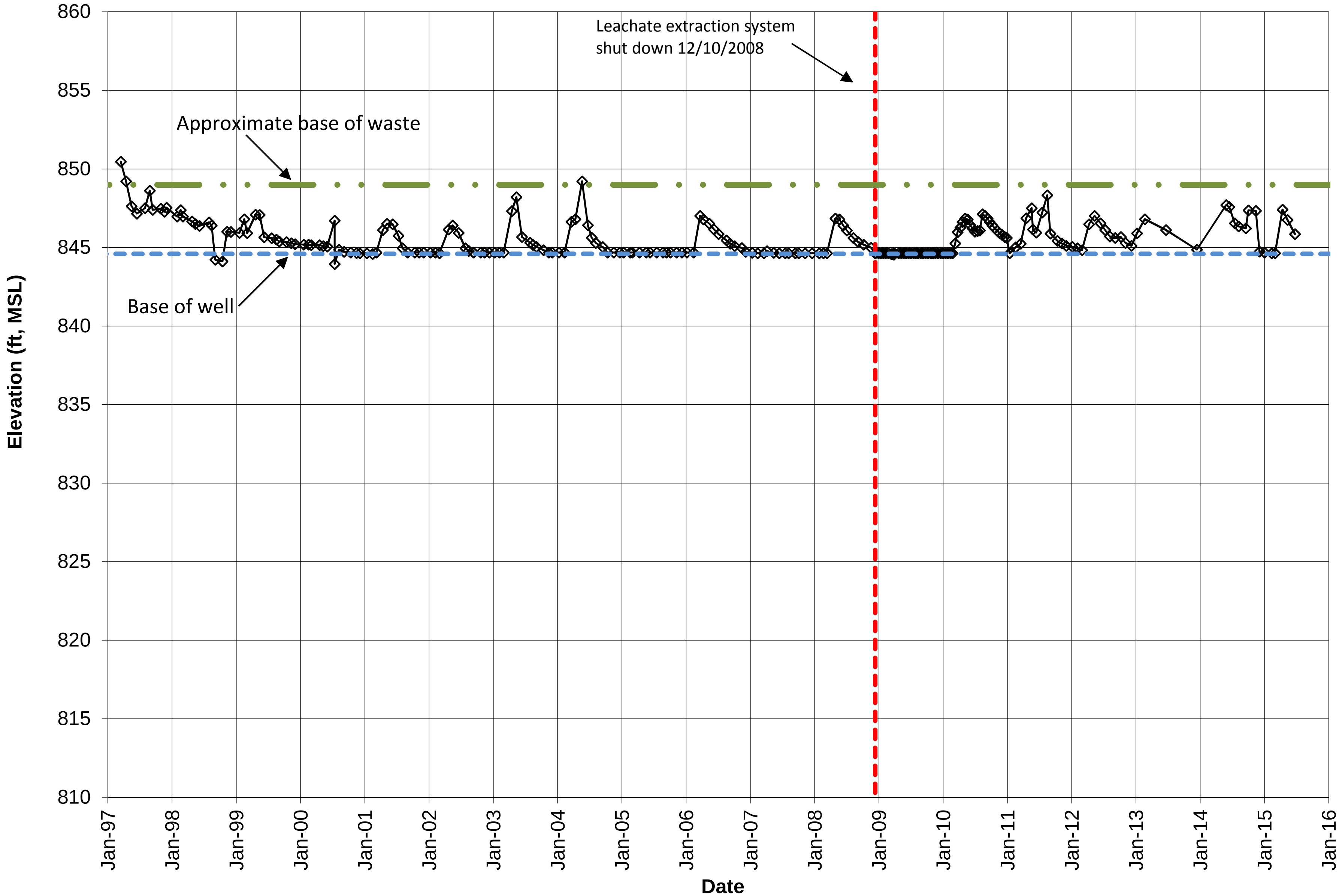
\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-002_Attachment A.xlsx

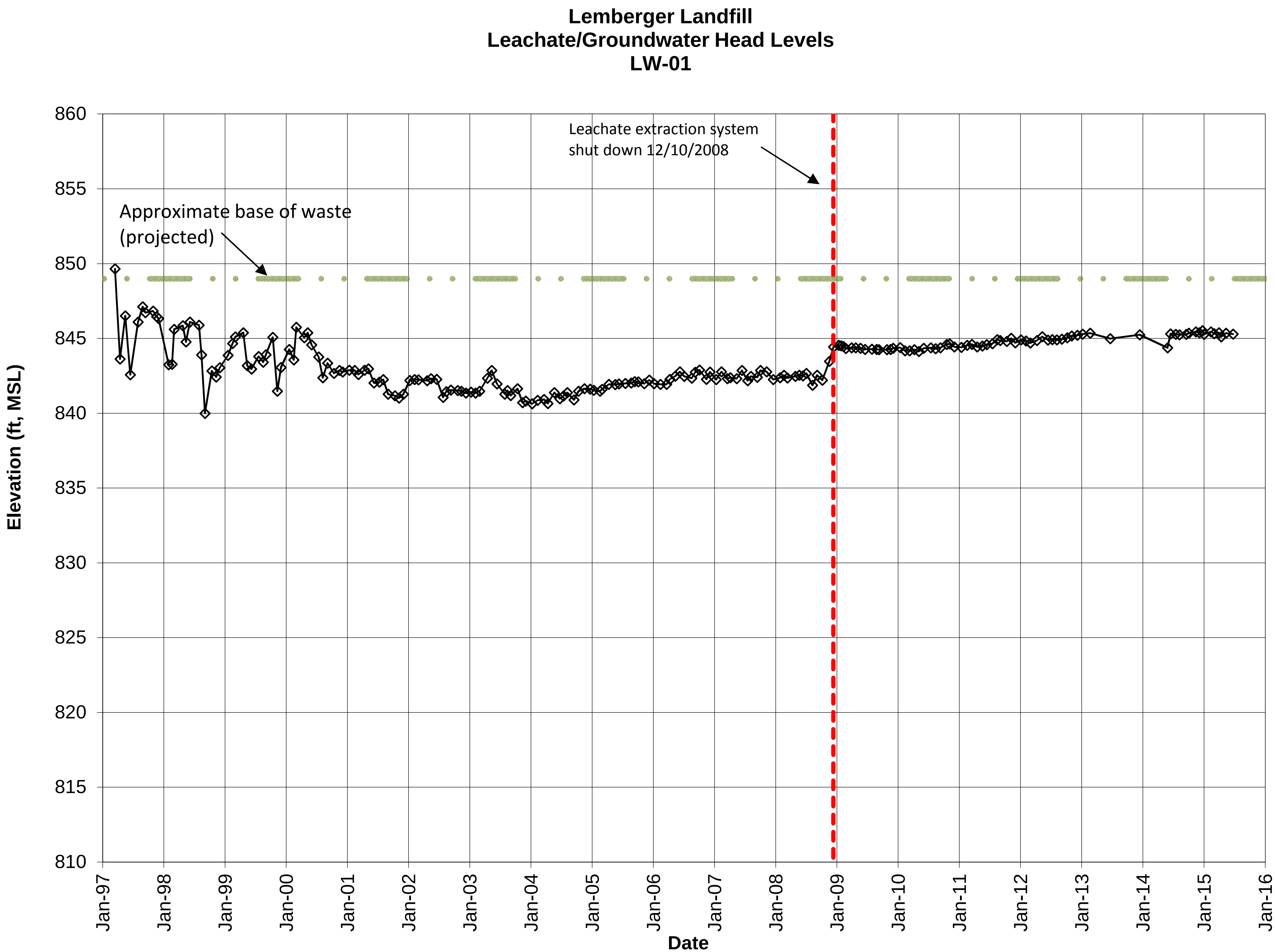
Lemberger Landfill
Leachate/Groundwater Head Levels
LH-06



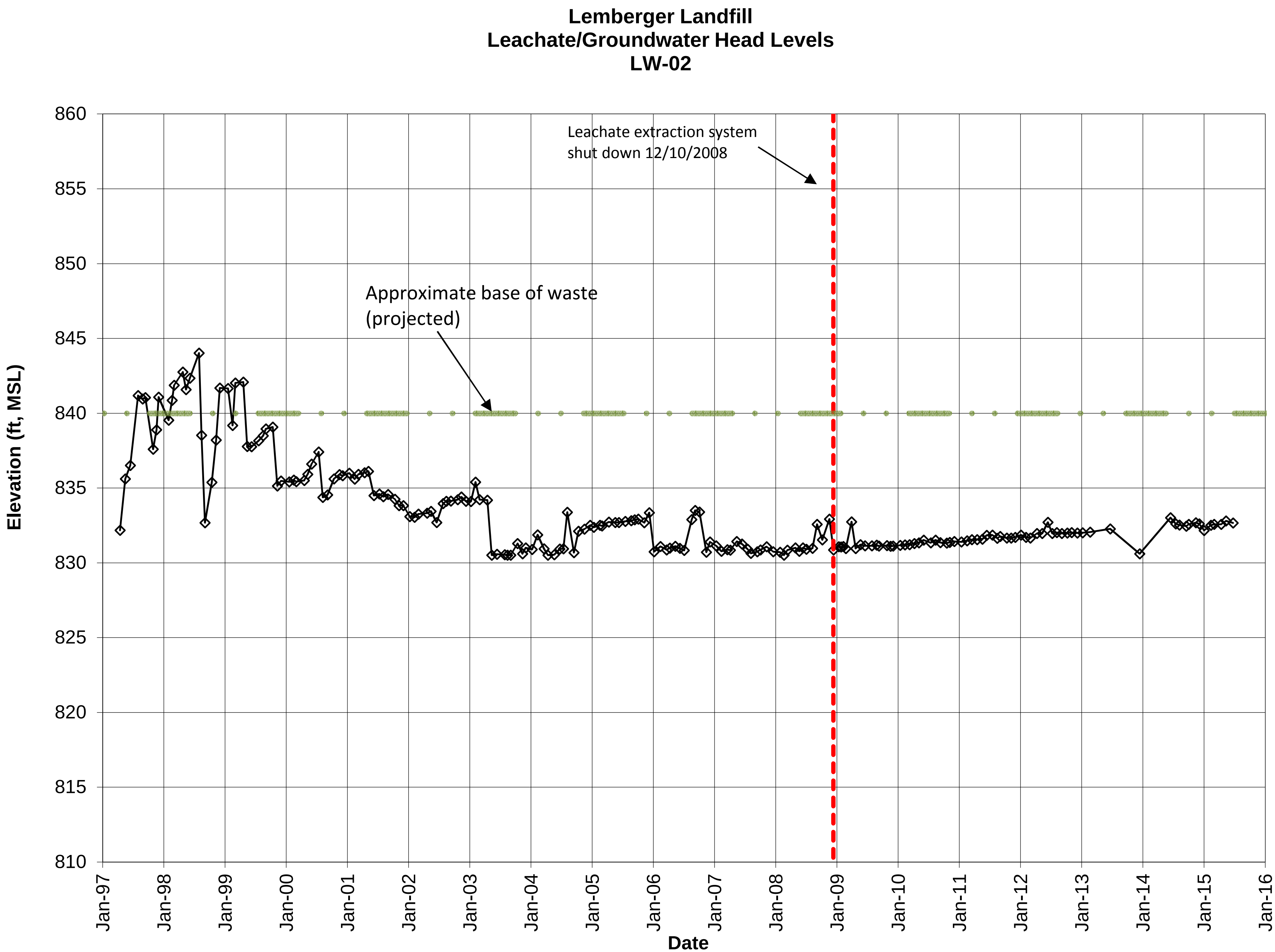
\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-002_Attachment A.xlsx

Lemberger Landfill
Leachate/Groundwater Head Levels
LH-07

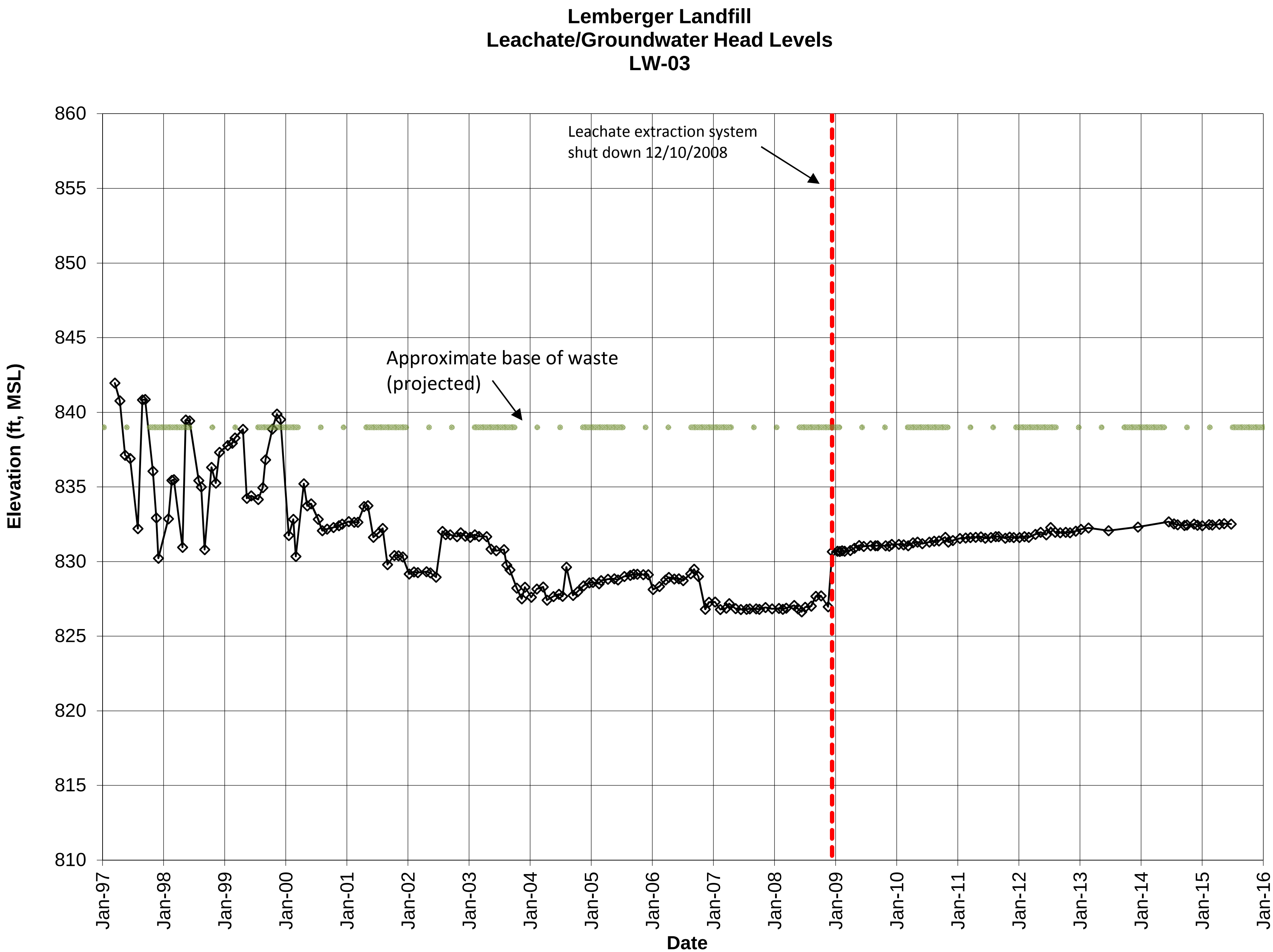




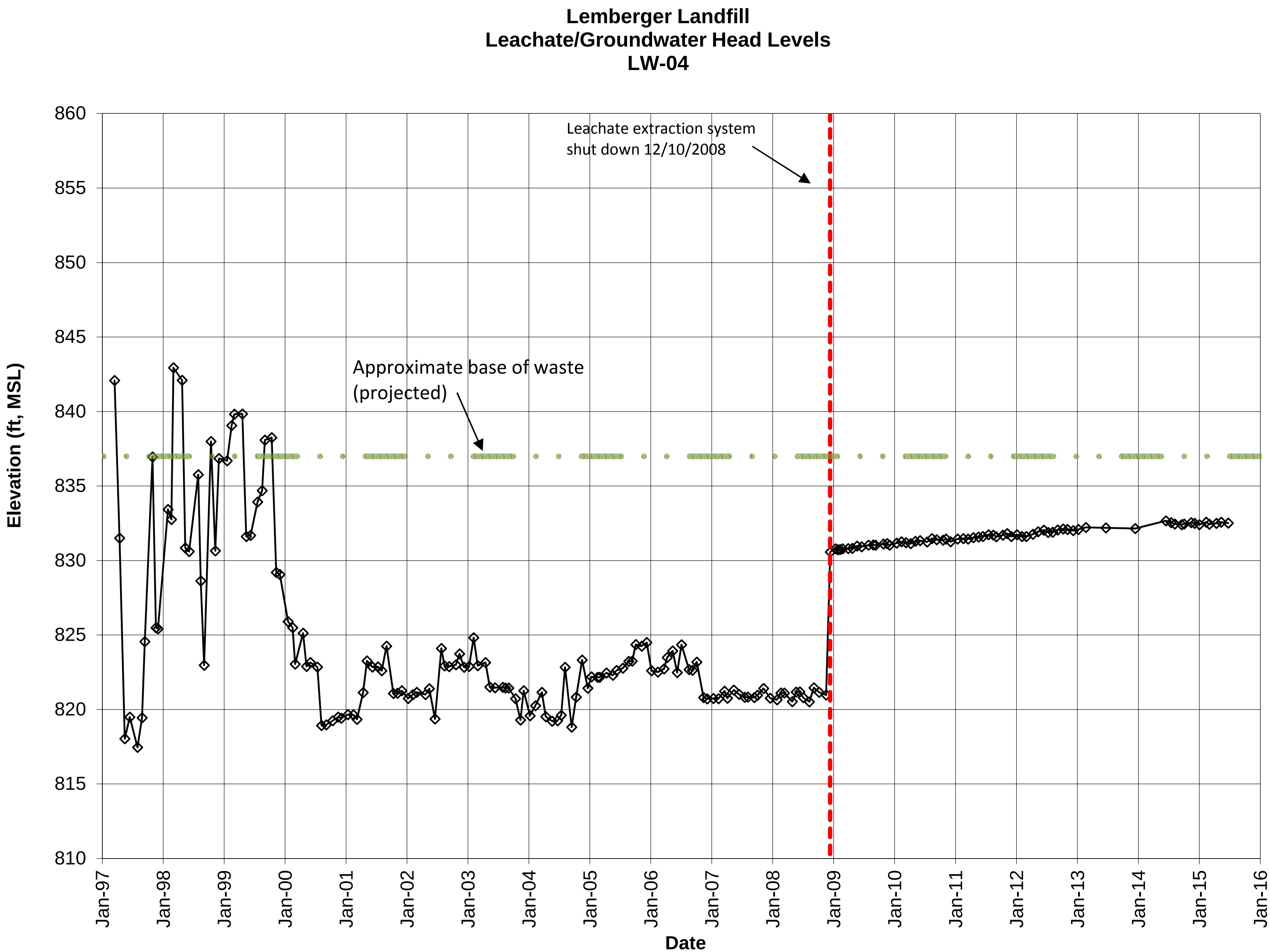
\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-002_Attachment A.xlsx



\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-002_Attachment A.xlsx

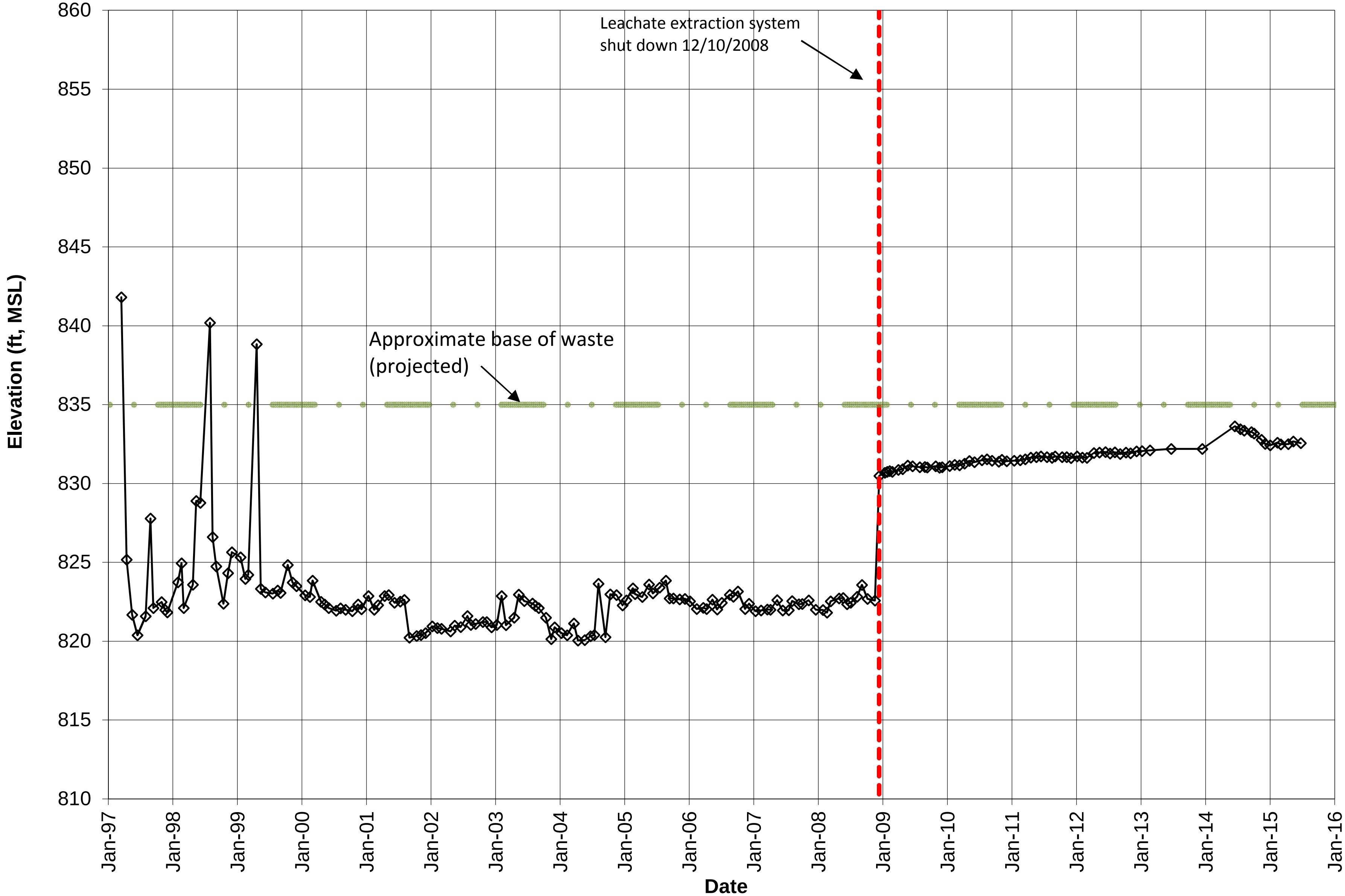


\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-002_Attachment A.xlsx

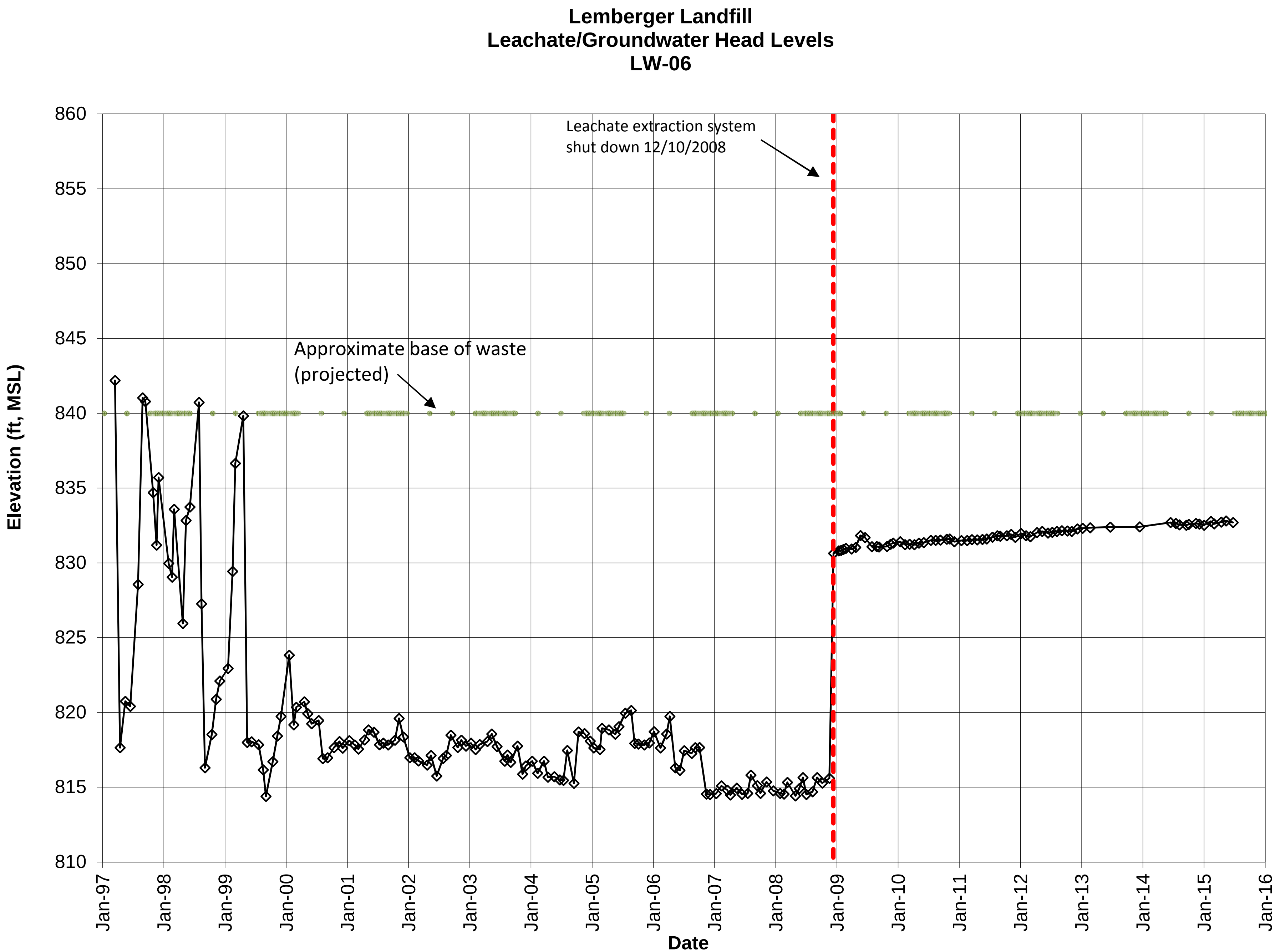


\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-002_Attachment A.xlsx

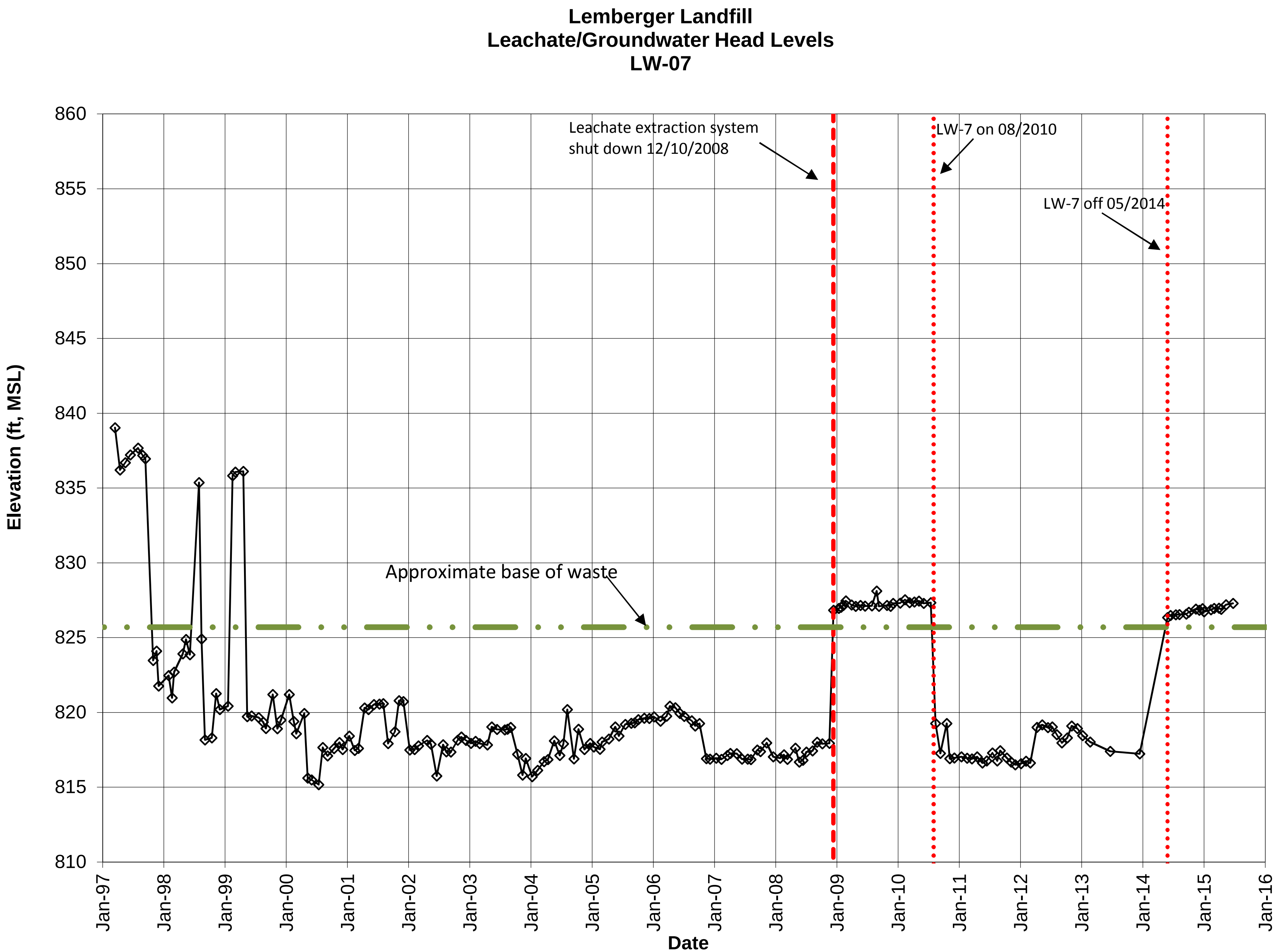
Lemberger Landfill
Leachate/Groundwater Head Levels
LW-05



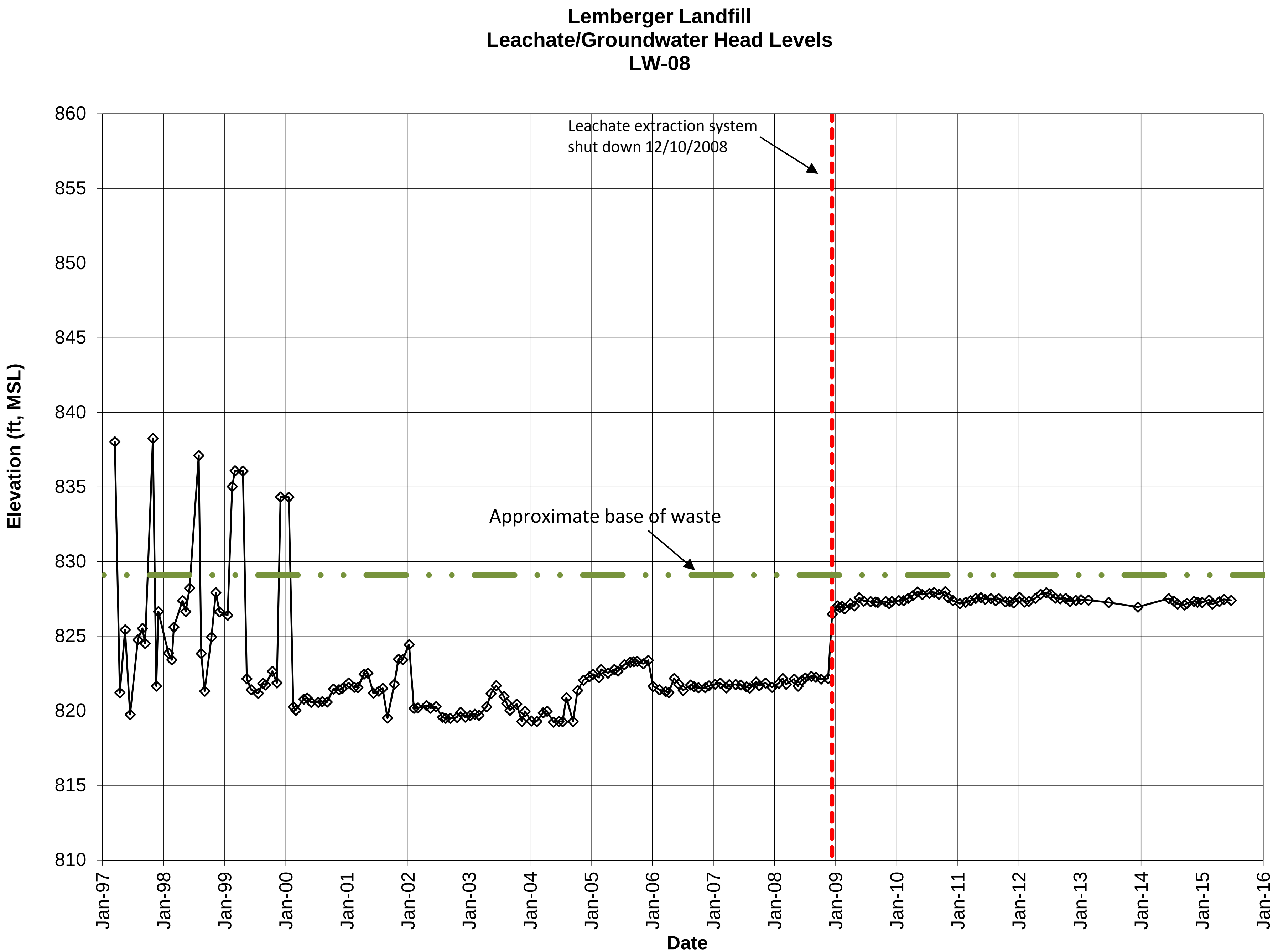
\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-002_Attachment A.xlsx



\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-002_Attachment A.xlsx

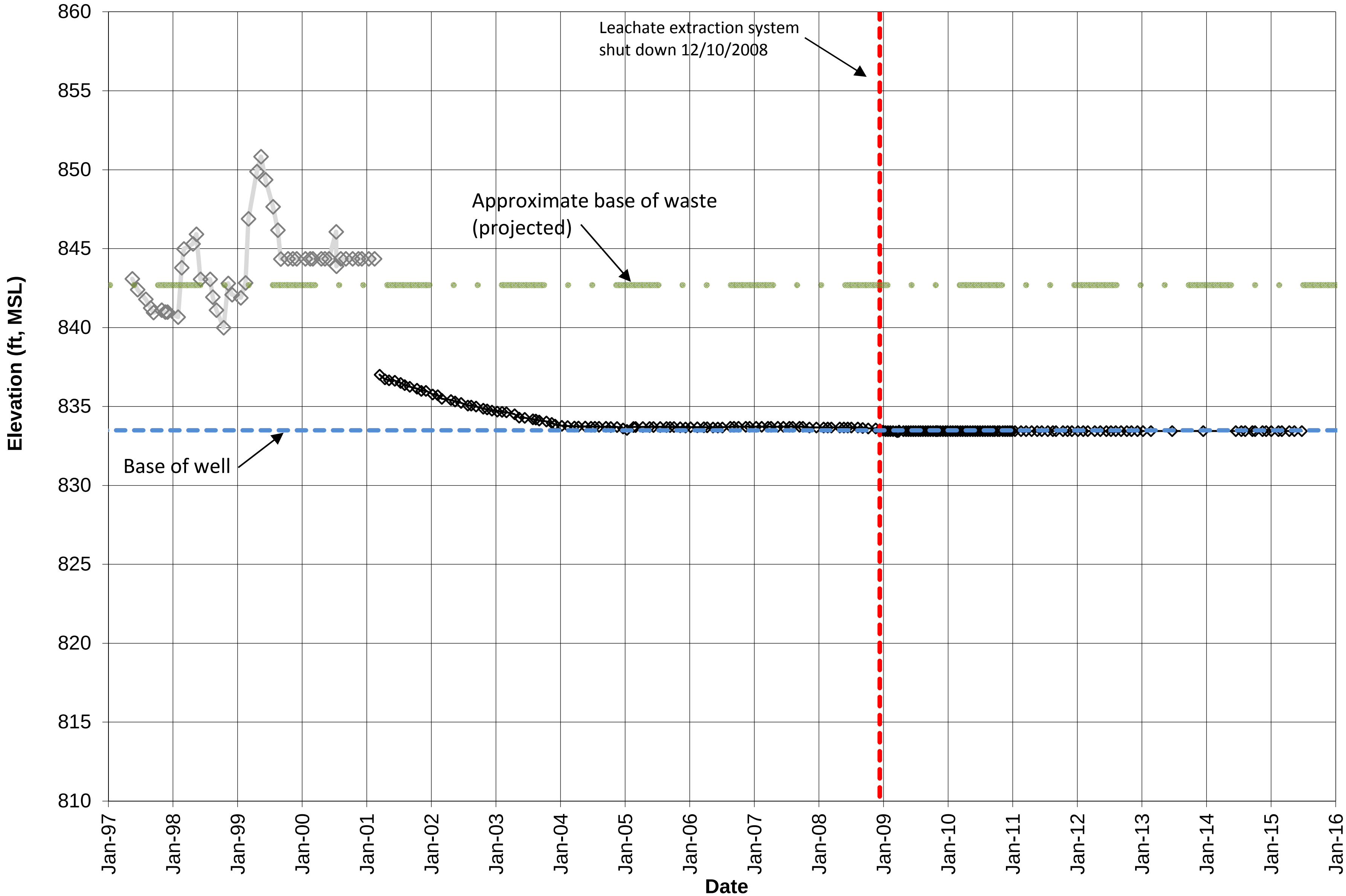


\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-002_Attachment A.xlsx



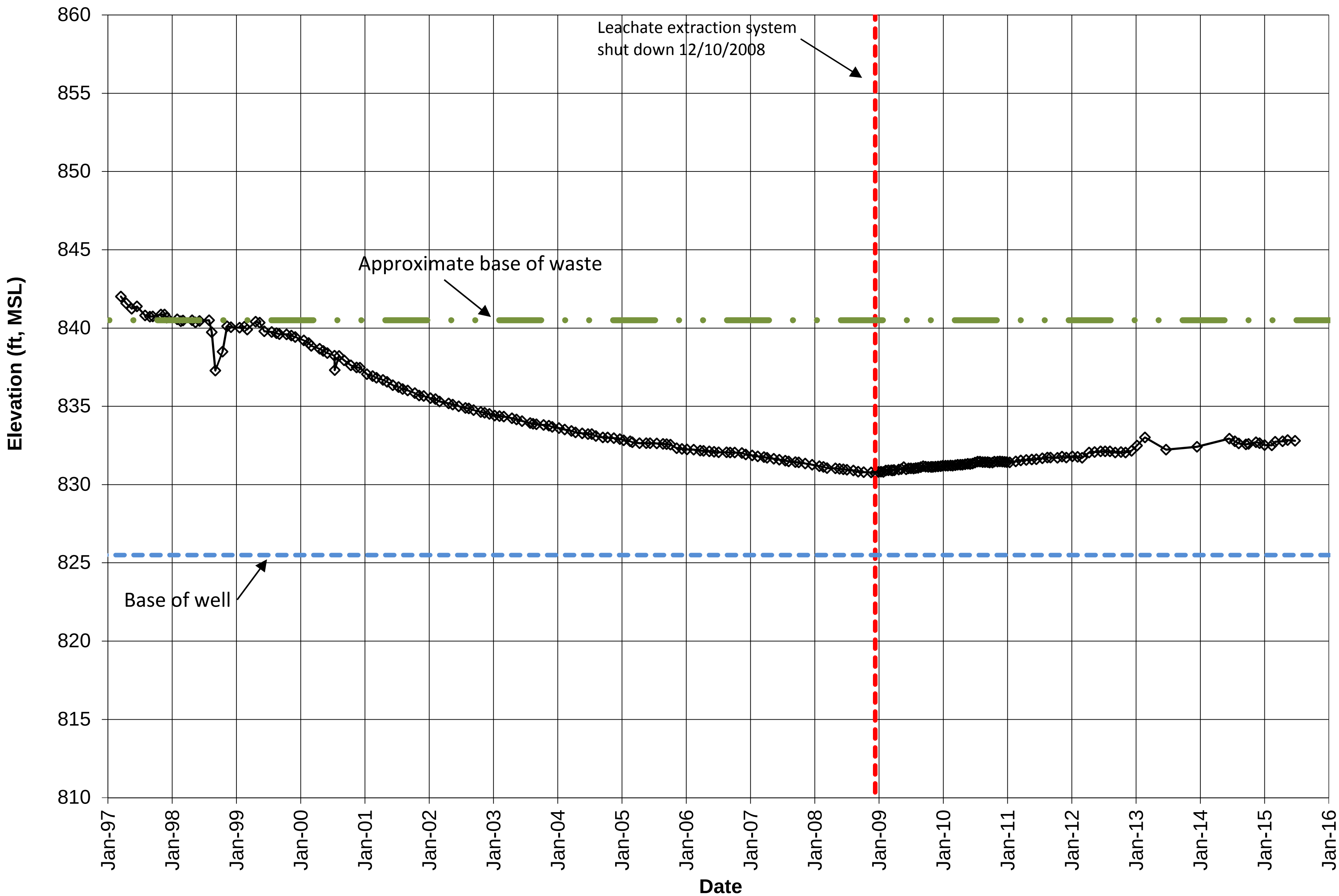
\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-002_Attachment A.xlsx

Lemberger Landfill
Leachate/Groundwater Head Levels
MW-14/MW-14R

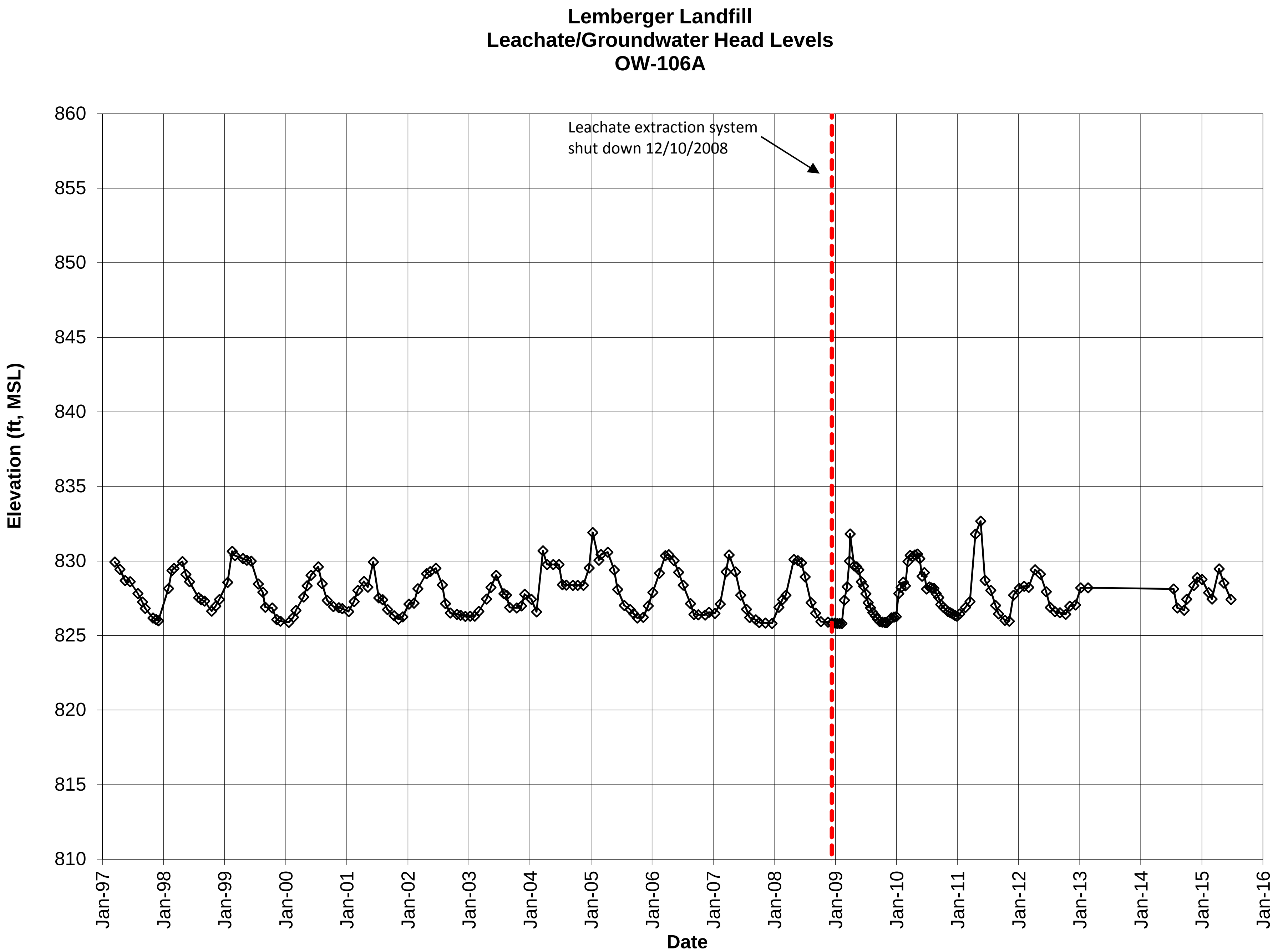


\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-002_Attachment A.xlsx

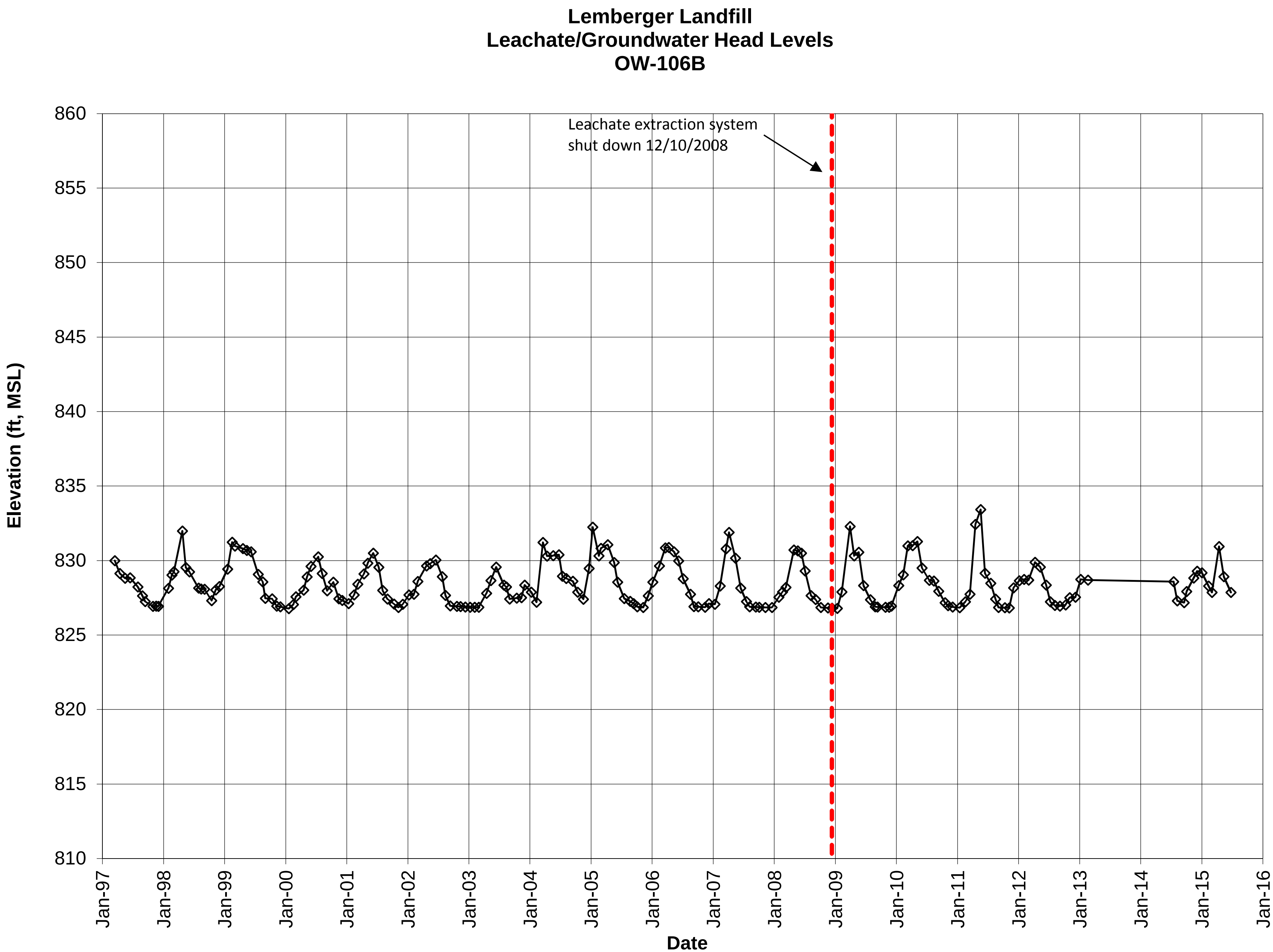
Lemberger Landfill
Leachate/Groundwater Head Levels
MW-15R



\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-002_Attachment A.xlsx

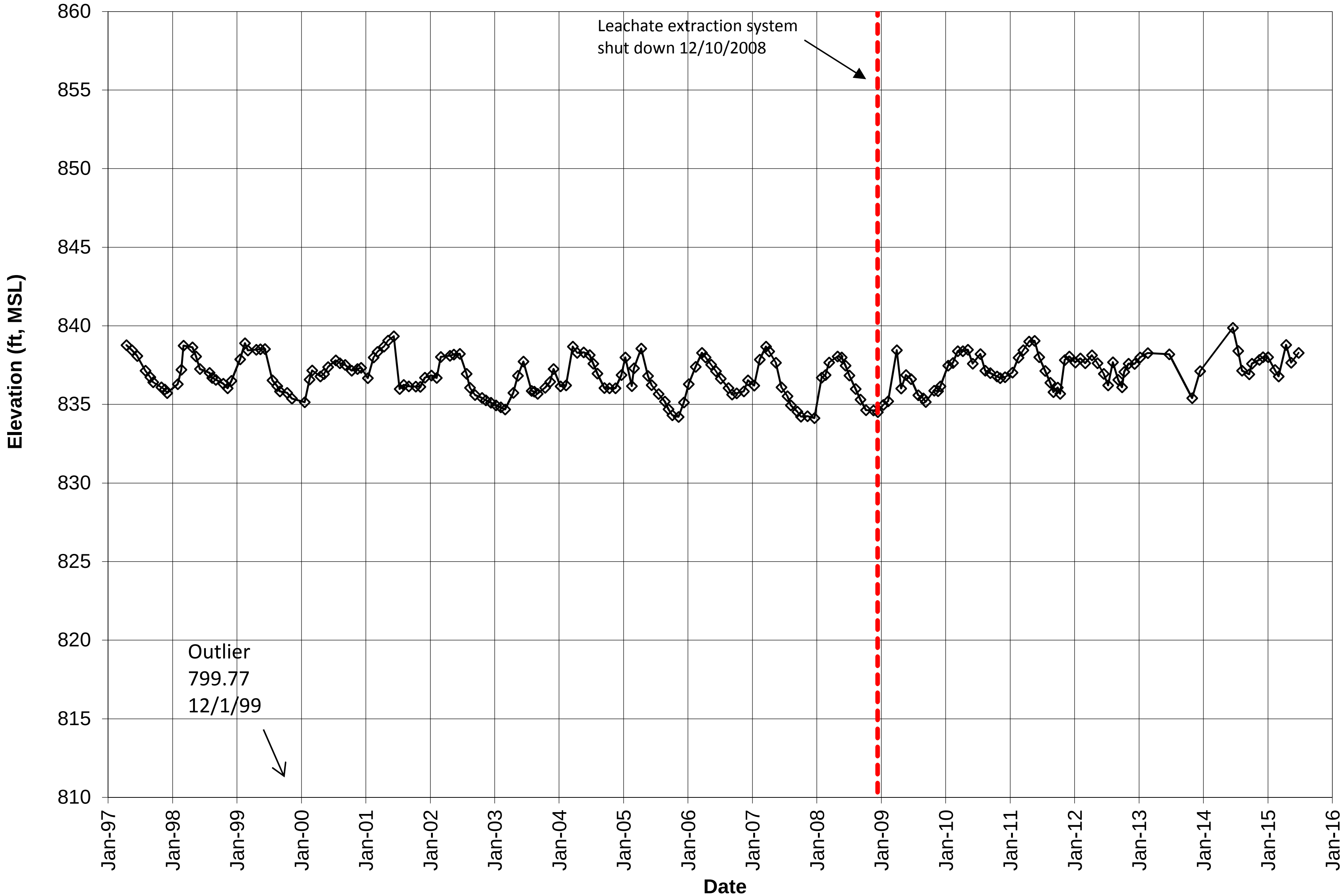


\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-002_Attachment A.xlsx

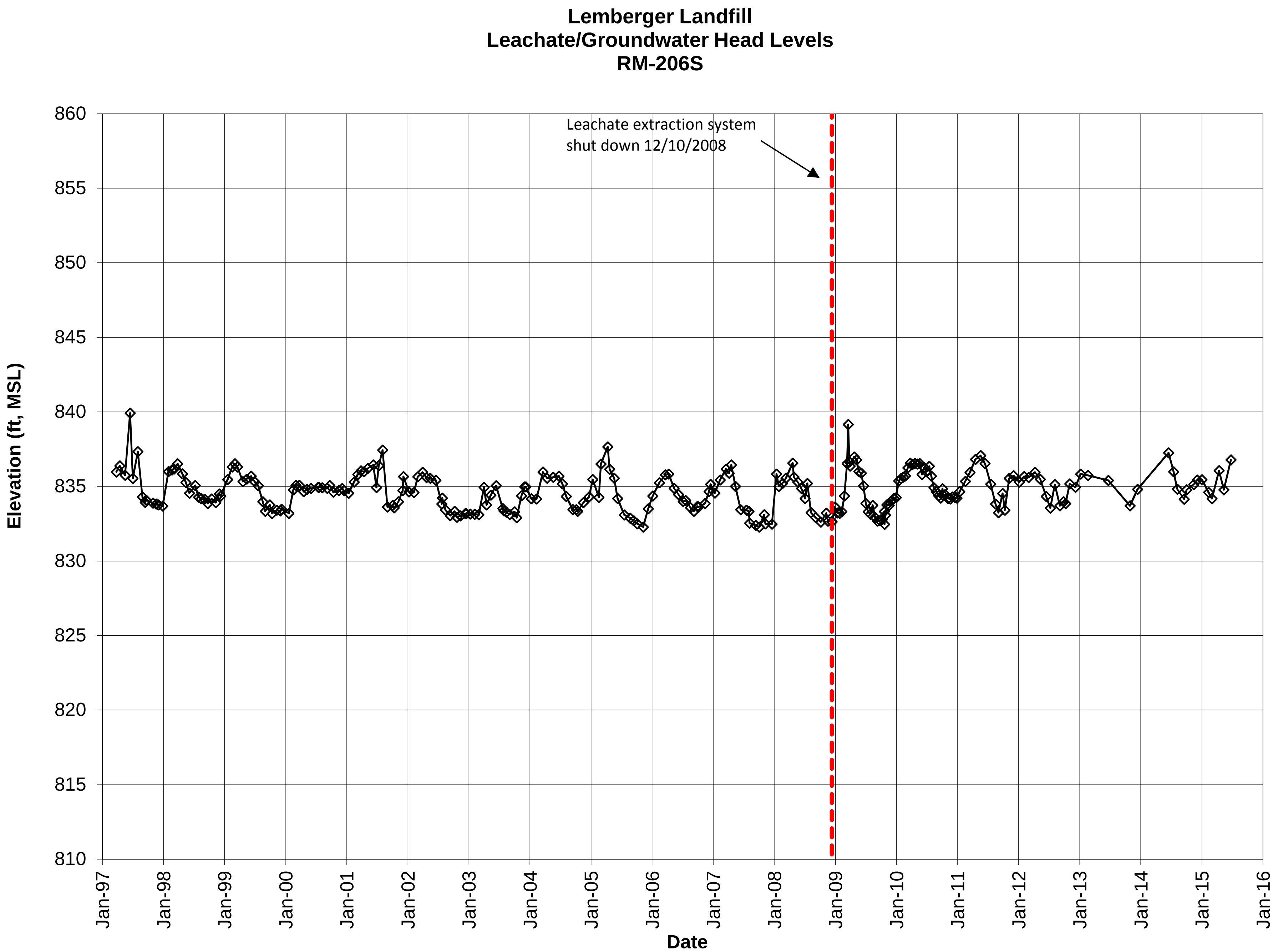


\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-002_Attachment A.xlsx

Lemberger Landfill
Leachate/Groundwater Head Levels
RM-005S

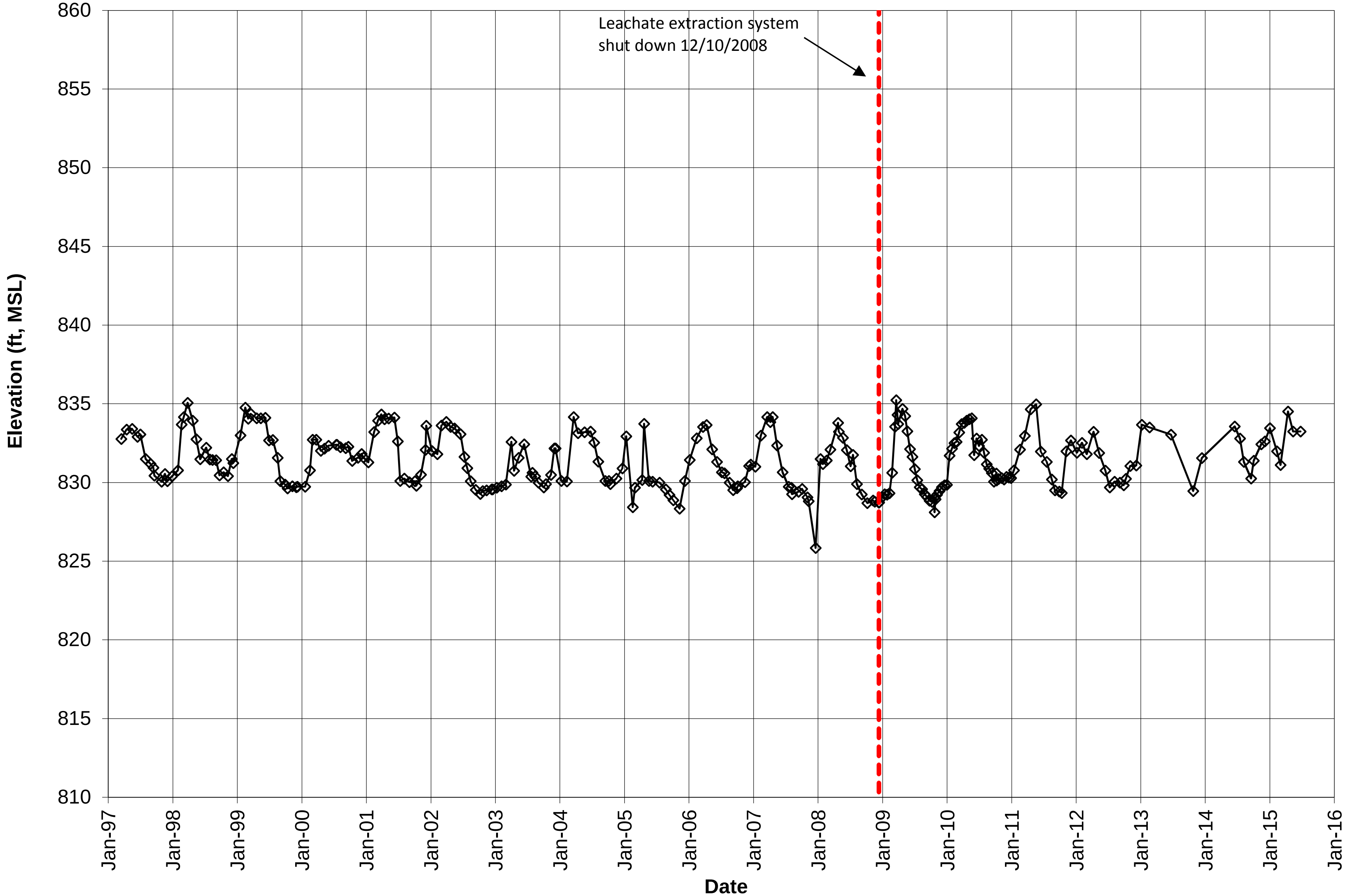


\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-002_Attachment A.xlsx

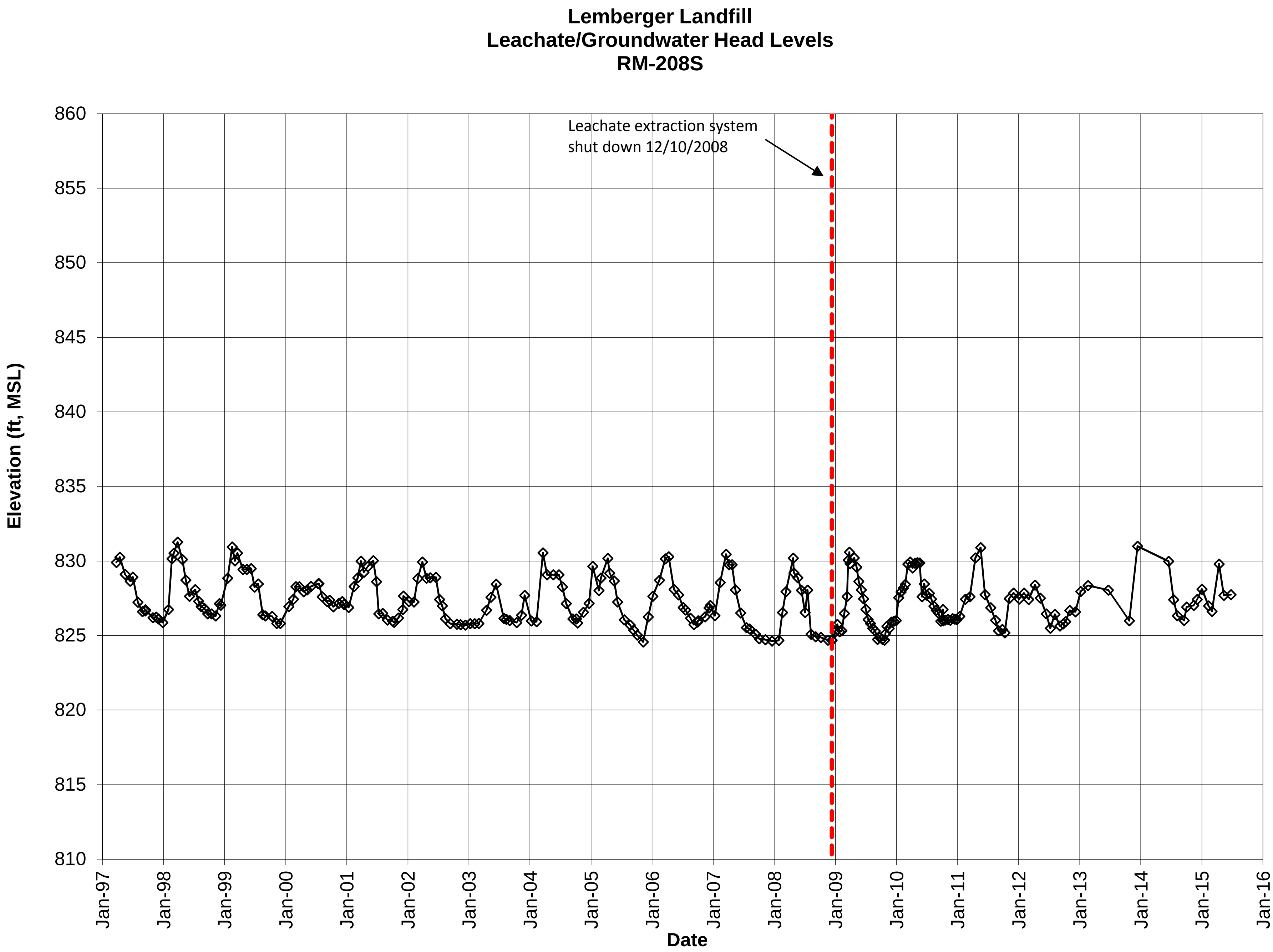


\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-002_Attachment A.xlsx

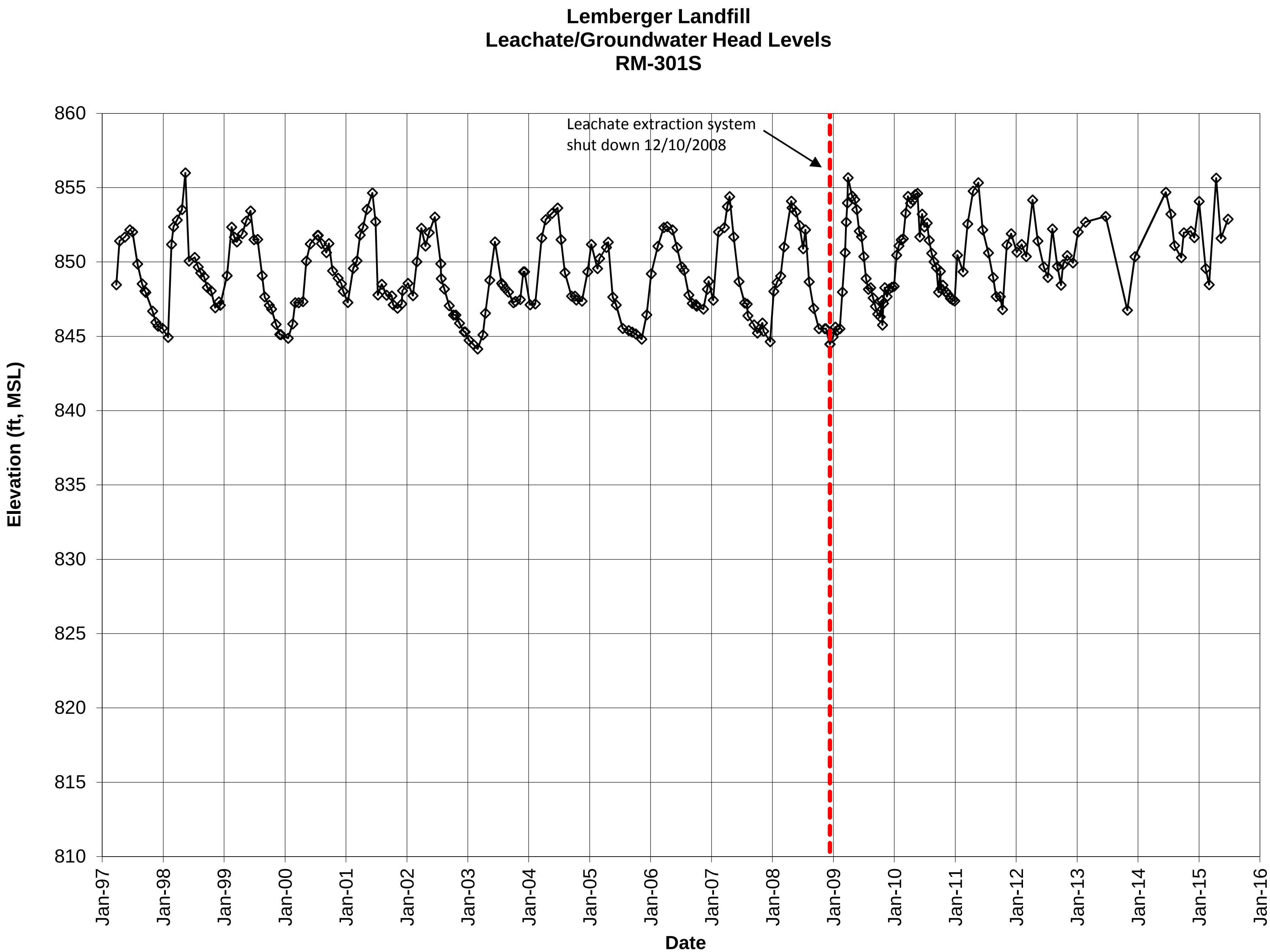
Lemberger Landfill
Leachate/Groundwater Head Levels
RM-207S



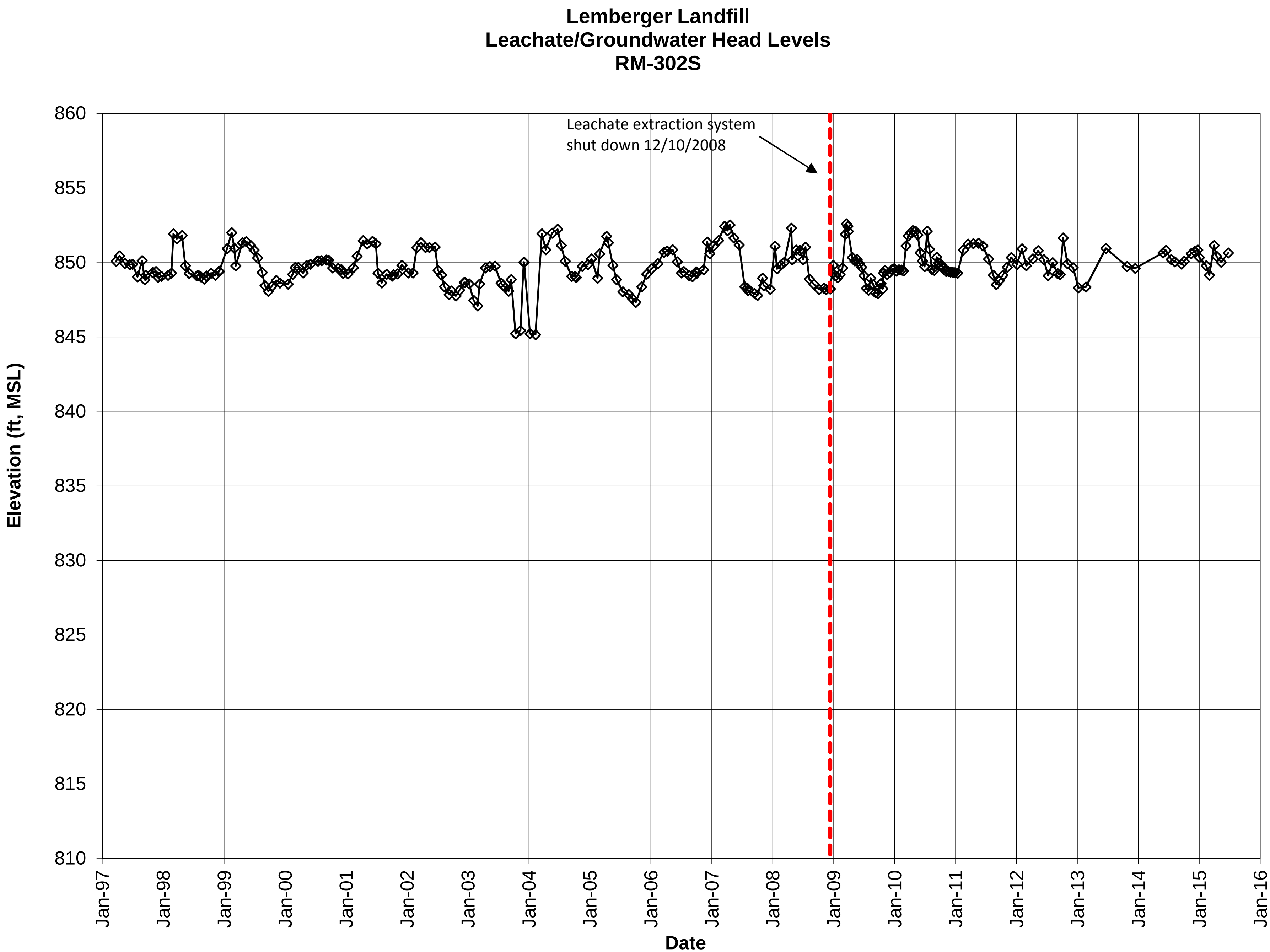
\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-002_Attachment A.xlsx



\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-002_Attachment A.xlsx



\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-002_Attachment A.xlsx



\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\226573\0000\000007\Z2265730000-002_Attachment A.xlsx

Appendix B
Analytical Data

Table B-1
Southeast Corner Analytical Summary – Field Analytical Data
Lemberger Landfill

PARAMETER	UNITS	LH-06 5/29/2014 4097237003	LH-06 10/5/2014 40104985X01	LH-06 12/23/2014 40108914X01	LH-06 4/1/2015 40112512002	LH-06 6/29/2015 40117429X01	LH-07 5/29/2014 4097237001	LH-07 12/23/2014 40108914X02	LH-07 4/1/2015 40112512X01
CONDUCTANCE, SPECIFIC	UMHOS/CM	710			672		819		
DISSOLVED OXYGEN, FIELD	MG/L	0.71			1.75		1.09		
EH, FIELD	MV	25			-7		-41		
ODOR, FIELD		NONE			NONE		NONE		
PH, FIELD	SU	7.04			6.02		6.93		
TEMPERATURE	DEG C	10.6			7.2		10.2		
TURBIDITY, FIELD NTU	NTU	15			8		12		

Table B-1
Southeast Corner Analytical Summary – Field Analytical Data
Lemberger Landfill

PARAMETER	UNITS	LH-07 6/29/2015 40117429X02	LW-01 5/29/2014 4097237002	LW-01 12/23/2014 40108914002	LW-01 4/1/2015 40112512004	LW-01 6/29/2015 40117429002	LW-07 5/29/2014 4097237004	LW-07 12/23/2014 40108914003	LW-07 4/1/2015 40112512003
CONDUCTANCE, SPECIFIC	UMHOS/CM		853	876	908	836	2940	2958	2974
DISSOLVED OXYGEN, FIELD	MG/L		1.14	2.05	0.72	1.36	0.88	0.50	2.51
EH, FIELD	MV		-63	-27	-24	8	0.54	-12	-9
ODOR, FIELD			NONE	NONE	NONE	NONE	NONE	NONE	NONE
PH, FIELD	SU		6.92	6.69	6.99	6.83	6.30	6.92	7.05
TEMPERATURE	DEG C		10.2	6.9	9.2	12.4	9.9	7.1	7.3
TURBIDITY, FIELD NTU	NTU		18	15	8	7	22	17	3

Table B-1
Southeast Corner Analytical Summary – Field Analytical Data
Lemberger Landfill

PARAMETER	UNITS	LW-07 6/29/2015 40117429001	RM-214D 6/27/2014 4098976001	RM-214D 12/12/2014 40108591002	RM-302S 5/29/2014 4097237005	RM-302S 12/23/2014 40108914001	RM-302S 4/1/2015 40112512001	RM-302S 6/29/2015 40117429003
CONDUCTANCE, SPECIFIC	UMHOS/CM	2014	1062	965	837	954	779	733
DISSOLVED OXYGEN, FIELD	MG/L	0.44	0.95	0.39	1.12	1.17	1.21	0.88
EH, FIELD	MV	11	69	66	113	26	23	27
ODOR, FIELD		NONE	NONE	NONE	NONE	NONE	NONE	NONE
PH, FIELD	SU	6.88	6.91	6.82	7.10	7.38	7.47	7.47
TEMPERATURE	DEG C	11.8	10.7	6.1	10.7	4.7	2.7	14.7
TURBIDITY, FIELD NTU	NTU	4	7	8	0	6	1	2

Table B-1
Southeast Corner Analytical Summary – Field Analytical Data
Lemberger Landfill

PARAMETER	UNITS	LH-06 5/29/2014	LH-06 4/1/2015	LH-07 5/29/2014	LW-01 5/29/2014	LW-01 12/23/2014	LW-01 4/1/2015	LW-01 6/29/2015	LW-07 5/29/2014	LW-07 12/23/2014
CONDUCTANCE, SPECIFIC	UMHOS/CM	710	672	819	853	876	908	836	2940	2958
DISSOLVED OXYGEN, FIELD	MG/L	0.71	1.75	1.09	1.14	2.05	0.72	1.36	0.88	0.50
EH, FIELD	MV	25	-7	-41	-63	-27	-24	8	0.54	-12
ODOR, FIELD		NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
PH, FIELD	SU	7.04	6.02	6.93	6.92	6.69	6.99	6.83	6.30	6.92
TEMPERATURE	DEG C	10.6	7.2	10.2	10.2	6.9	9.2	12.4	9.9	7.1
TURBIDITY, FIELD NTU	NTU	15	8	12	18	15	8	7	22	17

Note: LH-06 was dry on 10/5/2014, 12/23/14, and 6/29/15.

LH-07 was dry on 12/23/04, 4/1/15, and 6/29/15

Table B-1
Southeast Corner Analytical Summary – Field Analytical Data
Lemberger Landfill

PARAMETER	UNITS	LW-07 4/1/2015	LW-07 6/29/2015	RM-214D 6/27/2014	RM-214D 12/12/2014	RM-302S 5/29/2014	RM-302S 12/23/2014	RM-302S 4/1/2015	RM-302S 6/29/2015
CONDUCTANCE, SPECIFIC	UMHOS/CM	2974	2014	1062	965	837	954	779	733
DISSOLVED OXYGEN, FIELD	MG/L	2.51	0.44	0.95	0.39	1.12	1.17	1.21	0.88
EH, FIELD	MV	-9	11	69	66	113	26	23	27
ODOR, FIELD		NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
PH, FIELD	SU	7.05	6.88	6.91	6.82	7.10	7.38	7.47	7.47
TEMPERATURE	DEG C	7.3	11.8	10.7	6.1	10.7	4.7	2.7	14.7
TURBIDITY, FIELD NTU	NTU	3	4	7	8	0	6	1	2

Note: LH-06 was dry on 10/5/2014, 12/23/14, and 6/29/15.

LH-07 was dry on 12/23/04, 4/1/15, and 6/29/15

Table B-2
Southeast Corner Analytical Summary – Volatile Organic Compounds
Lemberger Landfill

PARAMETER	UNITS	LH-06 7/13/2000 902463-006	LH-06 5/29/2014 4097237003	LH-06 10/5/2014 40104985X01	LH-06 12/23/2014 40108914X01	LH-06 4/1/2015 40112512002	LH-06 6/29/2015 40117429X01	LH-07 7/13/2000 902463-007	LH-07 5/29/2014 4097237001
1,1,1-TRICHLOROETHANE	UG/L	**380 D**	0.72 J			< 5.0		< 0.53	< 0.50
1,1,2,2-TETRACHLOROETHANE	UG/L	< 0.68	< 0.25			< 2.5		< 0.68	< 0.25
1,1,2-TRICHLOROETHANE	UG/L	**6.8**	< 0.16			< 2.0		< 0.47	< 0.16
1,1-DICHLOROETHANE	UG/L	**1200 D**	31.3			33.5		< 0.61	< 0.18
1,1-DICHLOROETHENE	UG/L	2.8	< 0.41			< 4.1		< 0.47	< 0.41
1,2-DICHLOROETHANE	UG/L	**35**	1.1			**7.7 J**		< 0.54	< 0.17
1,2-DICHLOROETHENE, TOTAL	UG/L	**10000 D**	--			--		2.3 Q	--
1,2-DICHLOROPROPANE	UG/L	**5.6**	< 0.23			< 2.3		< 0.34	< 0.23
2-BUTANONE	UG/L	78	< 3.0			43.2 J		3.1 Q	< 3.0
2-HEXANONE	UG/L	18	< 1.1			< 11.1		< 0.61	< 1.1
4-METHYL-2-PENTANONE	UG/L	57	< 2.1			< 21.4		< 0.61	< 2.1
ACETONE	UG/L	< 3.1	7.5 J			2200		520 D	< 3.0
BENZENE	UG/L	**75**	0.98 J			**71.7**		**11**	< 0.50
BROMODICHLOROMETHANE	UG/L	< 0.41	< 0.50			< 5.0		< 0.41	< 0.50
BROMOFORM	UG/L	< 0.58	< 0.50			< 5.0		< 0.58	< 0.50
BROMOMETHANE	UG/L	< 0.94	< 2.4			< 24.3		< 0.94	< 2.4
CARBON DISULFIDE	UG/L	1.4	< 0.51			< 6.1		< 0.40	< 0.51
CARBON TETRACHLORIDE	UG/L	< 0.90	< 0.50			< 5.0		< 0.90	< 0.50
CHLOROBENZENE	UG/L	< 0.43	< 0.50			< 5.0		7.6	< 0.50
CHLORODIBROMOMETHANE	UG/L	< 0.43	< 0.32			< 5.0		< 0.43	< 0.32
CHLOROETHANE	UG/L	21	< 0.37			< 3.7		< 0.63	< 0.37
CHLOROFORM	UG/L	< 0.41	< 2.5			< 25.0		< 0.41	< 2.5
CHLOROMETHANE	UG/L	1.3 Q	< 0.50			< 5.0		< 0.44	< 0.50
CIS-1,2-DICHLOROETHENE	UG/L	--	**293**			**141**		--	< 0.26
CIS-1,3-DICHLOROPROPENE	UG/L	< 0.54	< 0.50			< 5.0		< 0.54	< 0.50
ETHYLBENZENE	UG/L	160	< 0.50			59.3		59	< 0.50
METHYLENE CHLORIDE	UG/L	**9600 D**	2.6 u			< 2.3		< 0.38	< 0.23
STYRENE	UG/L	< 0.37	< 0.50			< 5.0		< 0.37	< 0.50
TETRACHLOROETHENE	UG/L	**6.8**	1.1			< 5.0		< 0.41	< 0.50
TOLUENE	UG/L	610 D	0.90 J			18.6		1.1 Q	< 0.50
TRANS-1,2-DICHLOROETHENE	UG/L	--	1.8			3.1 J		--	< 0.24
TRANS-1,3-DICHLOROPROPENE	UG/L	< 0.26	< 0.23			< 2.3		< 0.26	< 0.23
TRICHLOROETHENE	UG/L	**47**	1.7			< 3.3		< 0.49	< 0.33
VINYL CHLORIDE	UG/L	**290 D**	**12.8**			< 1.8		< 0.17	< 0.18
XYLENE, TOTAL	UG/L	560 D	< 1.5			163		57	< 1.5
WELL DRY				00000	00000		00000		

Table B-2
Southeast Corner Analytical Summary – Volatile Organic Compounds
Lemberger Landfill

PARAMETER	UNITS	LH-07 10/5/2014 40104985003	LH-07 12/23/2014 40108914X02	LH-07 4/1/2015 40112512X01	LH-07 6/29/2015 40117429X02	LW-01 5/29/2014 4097237002	LW-01 10/5/2014 40104985001	LW-01 12/23/2014 40108914002	LW-01 4/1/2015 40112512004
1,1,1-TRICHLOROETHANE	UG/L	< 0.50				< 0.50	< 0.50	< 0.50	< 0.50
1,1,2,2-TETRACHLOROETHANE	UG/L	< 0.25				< 0.25	< 0.25	< 0.25	< 0.25
1,1,2-TRICHLOROETHANE	UG/L	< 0.16				< 0.16	< 0.16	< 0.16	< 0.20
1,1-DICHLOROETHANE	UG/L	0.32 J				< 0.18	< 0.24	< 0.24	< 0.24
1,1-DICHLOROETHENE	UG/L	< 0.41				< 0.41	< 0.41	< 0.41	< 0.41
1,2-DICHLOROETHANE	UG/L	< 0.17				< 0.17	< 0.17	< 0.17	< 0.17
1,2-DICHLOROETHENE, TOTAL	UG/L	--				--	--	--	--
1,2-DICHLOROPROPANE	UG/L	< 0.23				< 0.23	< 0.23	< 0.23	< 0.23
2-BUTANONE	UG/L	< 3.0				< 3.0	< 3.0	< 3.0	< 3.0
2-HEXANONE	UG/L	< 1.1				< 1.1	< 1.1	< 1.1	< 1.1
4-METHYL-2-PENTANONE	UG/L	< 2.1				< 2.1	< 2.1	< 2.1	< 2.1
ACETONE	UG/L	74.5				< 3.0	< 3.0	< 3.0	< 3.0
BENZENE	UG/L	1.5				< 0.50	< 0.50	< 0.50	< 0.50
BROMODICHLOROMETHANE	UG/L	< 0.50				< 0.50	< 0.50	< 0.50	< 0.50
BROMOFORM	UG/L	< 0.50				< 0.50	< 0.50	< 0.50	< 0.50
BROMOMETHANE	UG/L	< 2.4				< 2.4	< 2.4	< 2.4	< 2.4
CARBON DISULFIDE	UG/L	< 0.61				< 0.51	< 0.61	< 0.61	< 0.61
CARBON TETRACHLORIDE	UG/L	< 0.50				< 0.50	< 0.50	< 0.50	< 0.50
CHLOROBENZENE	UG/L	0.53 J				0.82 J	0.76 J	0.50 J	0.76 J
CHLORODIBROMOMETHANE	UG/L	< 0.50				< 0.32	< 0.50	< 0.50	< 0.50
CHLOROETHANE	UG/L	< 0.37				< 0.37	< 0.37	< 0.37	< 0.37
CHLOROFORM	UG/L	< 2.5				< 2.5	< 2.5	< 2.5	< 2.5
CHLOROMETHANE	UG/L	< 0.50				< 0.50	< 0.50	< 0.50	< 0.50
CIS-1,2-DICHLOROETHENE	UG/L	< 0.26				< 0.26	< 0.26	< 0.26	< 0.26
CIS-1,3-DICHLOROPROPENE	UG/L	< 0.50				< 0.50	< 0.50	< 0.50	< 0.50
ETHYLBENZENE	UG/L	0.69 J				< 0.50	< 0.50	< 0.50	< 0.50
METHYLENE CHLORIDE	UG/L	< 0.23				< 0.23	< 0.23	< 0.23	< 0.23
STYRENE	UG/L	< 0.50				< 0.50	< 0.50	< 0.50	< 0.50
TETRACHLOROETHENE	UG/L	< 0.50				< 0.50	< 0.50	< 0.50	< 0.50
TOLUENE	UG/L	< 0.50				< 0.50	< 0.50	< 0.50	< 0.50
TRANS-1,2-DICHLOROETHENE	UG/L	< 0.26				< 0.24	< 0.26	< 0.26	< 0.26
TRANS-1,3-DICHLOROPROPENE	UG/L	< 0.23				< 0.23	< 0.23	< 0.23	< 0.23
TRICHLOROETHENE	UG/L	< 0.33				< 0.33	< 0.33	< 0.33	< 0.33
VINYL CHLORIDE	UG/L	< 0.18				< 0.18	< 0.18	< 0.18	< 0.18
XYLENE, TOTAL	UG/L	< 1.5				< 1.5	< 1.5	< 1.5	< 1.5
WELL DRY			00000	00000	00000				

Table B-2
Southeast Corner Analytical Summary – Volatile Organic Compounds
Lemberger Landfill

PARAMETER	UNITS	LW-01 6/29/2015 40117429002	LW-07 8/3/2010 4035229001	LW-07 5/29/2014 4097237004	LW-07 10/5/2014 40104985002	LW-07 12/23/2014 40108914003	LW-07 4/1/2015 40112512003	LW-07 6/29/2015 40117429001	RM-302S 7/19/2000 902564-011
1,1,1-TRICHLOROETHANE	UG/L	< 0.50	< 0.9	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.53
1,1,2,2-TETRACHLOROETHANE	UG/L	< 0.25	< 0.2	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.68
1,1,2-TRICHLOROETHANE	UG/L	< 0.20	< 0.42	< 0.16	< 0.16	< 0.16	< 0.20	< 0.20	< 0.47
1,1-DICHLOROETHANE	UG/L	< 0.24	1.2	1.5	0.96 J	0.94 J	0.76 J	0.61 J	< 0.61
1,1-DICHLOROETHENE	UG/L	< 0.41	< 0.57	< 0.41	< 0.41	< 0.41	< 0.41	< 0.41	< 0.47
1,2-DICHLOROETHANE	UG/L	< 0.17	< 0.36	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.54
1,2-DICHLOROETHENE, TOTAL	UG/L	--	--	--	--	--	--	--	< 0.90
1,2-DICHLOROPROPANE	UG/L	< 0.23	< 0.49	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.34
2-BUTANONE	UG/L	< 3.0	< 4.3	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 1.2
2-HEXANONE	UG/L	< 1.1	< 2	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 0.61
4-METHYL-2-PENTANONE	UG/L	< 2.1	< 1.2	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1	< 0.61
ACETONE	UG/L	< 3.0	7.1 J	< 3.0	< 3.0	6.0 J	5.0 J	< 3.0	< 3.1
BENZENE	UG/L	< 0.50	**9.9**	**9.2**	**12.5**	**10.9**	**8.1**	**8.0**	< 0.44
BROMODICHLOROMETHANE	UG/L	< 0.50	< 0.56	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.41
BROMOFORM	UG/L	< 0.50	< 0.94	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.58
BROMOMETHANE	UG/L	< 2.4	< 0.91	< 2.4	< 2.4	< 2.4	< 2.4	< 2.4	< 0.94
CARBON DISULFIDE	UG/L	< 0.61	< 0.66	< 0.51	< 0.61	< 0.61	< 0.61	< 0.61	< 0.40
CARBON TETRACHLORIDE	UG/L	< 0.50	< 0.49	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.90
CHLOROBENZENE	UG/L	0.62 J	0.80 J	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.43
CHLORODIBROMOMETHANE	UG/L	< 0.50	< 0.81	< 0.32	< 0.50	< 0.50	< 0.50	< 0.50	< 0.43
CHLOROETHANE	UG/L	< 0.37	47.0	31.3	25.0	22.7	21.6	15.6	< 0.63
CHLOROFORM	UG/L	< 2.5	< 1.3	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 0.41
CHLOROMETHANE	UG/L	< 0.50	< 0.24	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.44
CIS-1,2-DICHLOROETHENE	UG/L	< 0.26	< 0.83	< 0.26 HS	< 0.26	< 0.26	< 0.26	< 0.26	--
CIS-1,3-DICHLOROPROPENE	UG/L	< 0.50	< 0.2	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.54
ETHYLBENZENE	UG/L	< 0.50	< 0.54	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
METHYLENE CHLORIDE	UG/L	< 0.23	1.8 Z3	1.1 u	0.87 Ju	0.85 J	0.85 J	0.51 J	< 0.38
STYRENE	UG/L	< 0.50	< 0.86	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.37
TETRACHLOROETHENE	UG/L	< 0.50	< 0.45	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.41
TOLUENE	UG/L	< 0.50	< 0.67	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.40
TRANS-1,2-DICHLOROETHENE	UG/L	< 0.26	< 0.89	< 0.24	< 0.26	< 0.26	< 0.26	< 0.26	--
TRANS-1,3-DICHLOROPROPENE	UG/L	< 0.23	< 0.19	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.26
TRICHLOROETHENE	UG/L	< 0.33	< 0.48	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.49
VINYL CHLORIDE	UG/L	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.17
XYLENE, TOTAL	UG/L	< 1.5	39.4	26.3	6.5	7.4	8.5	6.2	< 1.2
WELL DRY									

Table B-2
Southeast Corner Analytical Summary – Volatile Organic Compounds
Lemberger Landfill

PARAMETER	UNITS	RM-302S 5/29/2014 4097237005	RM-302S 10/6/2014 40104983001	RM-302S 12/23/2014 40108914001	RM-302S 4/1/2015 40112512001	RM-302S 6/29/2015 40117429003
1,1,1-TRICHLOROETHANE	UG/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1,2,2-TETRACHLOROETHANE	UG/L	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
1,1,2-TRICHLOROETHANE	UG/L	< 0.16	< 0.16	< 0.16	< 0.20	< 0.20
1,1-DICHLOROETHANE	UG/L	< 0.18	< 0.24	< 0.24	< 0.24	< 0.24
1,1-DICHLOROETHENE	UG/L	< 0.41	< 0.41	< 0.41	< 0.41	< 0.41
1,2-DICHLOROETHANE	UG/L	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17
1,2-DICHLOROETHENE, TOTAL	UG/L	--	--	--	--	--
1,2-DICHLOROPROPANE	UG/L	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23
2-BUTANONE	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
2-HEXANONE	UG/L	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
4-METHYL-2-PENTANONE	UG/L	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1
ACETONE	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
BENZENE	UG/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
BROMODICHLOROMETHANE	UG/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
BROMOFORM	UG/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
BROMOMETHANE	UG/L	< 2.4	< 2.4	< 2.4	< 2.4	< 2.4
CARBON DISULFIDE	UG/L	< 0.51	< 0.61	< 0.61	< 0.61	< 0.61
CARBON TETRACHLORIDE	UG/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
CHLOROBENZENE	UG/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
CHLORODIBROMOMETHANE	UG/L	< 0.32	< 0.50	< 0.50	< 0.50	< 0.50
CHLOROETHANE	UG/L	< 0.37	< 0.37	< 0.37	< 0.37	< 0.37
CHLOROFORM	UG/L	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5
CHLOROMETHANE	UG/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
CIS-1,2-DICHLOROETHENE	UG/L	< 0.26	< 0.26	< 0.26	< 0.26 M1j	< 0.26
CIS-1,3-DICHLOROPROPENE	UG/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
ETHYLBENZENE	UG/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
METHYLENE CHLORIDE	UG/L	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23
STYRENE	UG/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
TETRACHLOROETHENE	UG/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
TOLUENE	UG/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
TRANS-1,2-DICHLOROETHENE	UG/L	< 0.24	< 0.26	< 0.26	< 0.26	< 0.26
TRANS-1,3-DICHLOROPROPENE	UG/L	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23
TRICHLOROETHENE	UG/L	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
VINYL CHLORIDE	UG/L	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18
XYLENE, TOTAL	UG/L	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
WELL DRY						